

COMPUTER WORK

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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The Microsearch 400 terminal includes a keyboard, strip printer, readout, cassette pocket, microfilm viewer, and an acoustic coupler.

Dial-Up Retrieval System Finds In-House Microfilm

By a CW Staff Writer

NEW YORK — A microfilm retrieval system that makes use of a remote time-sharing computer was demonstrated here last week. The system makes it unnecessary for the user to have an in-house computer available to retrieve documents from his microfilm files. It is also much cheaper than maintaining the data on tape or disk either in-house or at a service bureau, according to the developer, DSI Systems Inc.

The system allows for minor updating of records, but major updating will require rephotographing the record or cross-referencing to a later record.

The system uses a special terminal called the Microsearch 400, which combines a microfilm reader, a strip printer, a keyboard, and an acoustic coupler.

As part of the demonstration, what was said to be a complete current file of U.S. Army officers on active duty was pre-stored on less than two microfilm cassettes. Names selected at random were located in seconds

by the system.

To retrieve a document, a person calls the nearest DSI branch center, puts the headset in the coupler, and inputs index information. An Interdata 4 computer at the center relays the query to a PDP-10 at the main DSI center and gets back the cassette number and the frame number. This is then relayed to the terminal, where it appears on a readout. When the correct cassette is put in the terminal, the computer directs a search for the desired frame. At the same time, updated information is printed out on the strip printer.

To establish a microfilm retrieval system, the user either photographs his own files or sends them to one of the DSI centers. During this process of computer-out to microfilm (COM), index references are compiled and stored at Rockville, Md. DSI uses a Stromberg-Carlson SC-4440 to transfer data from magnetic tape to microfilm.

The system is to be offered on a leased basis. Monthly rental

(Continued on Page 4)

CDC to Unbundle, Raise Prices; GE to Stay Bundled, Up Prices

Control Data Corp. will separate the pricing of its hardware, software, and services. At the same time, CDC announced a price increase averaging about 5% on hardware and on maintenance of leased systems.

CDC thus became the first computer manufacturer to follow IBM's lead to full unbundling.

General Electric, just before the CDC announcement, said it would not further separate the pricing of hardware, software, and services. GE also announced price increases ranging from 3% to 5.1%.

Since the IBM announcement June 23, Burroughs has stated it will offer an optional unbundling plan. Honeywell and Univac have announced they will not unbundle.

The CDC price increases will be effective Oct. 1 for all proposals submitted after that date, the company said. Price schedules will be available on Oct. 1, a CDC spokesman said.

Support services that will be priced separately effective Jan. 1 include: education and training, systems and application analysis, and software systems and programs. Software now available or released before then will continue to be included in the hardware price, CDC said.

Maintenance prices on new leased systems will go up Oct. 1. For existing leases, the increase will take effect when the lease expires or on Jan. 1, whichever comes first, CDC said.

Rental rates on the GE-400 and GE-600 lines are being increased 5.1% and purchase prices by 3%. Rental rates on the GE-200 are being increased by less than 1%. Maintenance prices for purchased equipment will be increased 3% on the GE-200, 400, and 600 lines. The GE-50 and the GE-100 lines are essentially not affected.

The increases will apply to all contracts entered into on or

after Oct. 1. Rental rate and maintenance price increases under existing contracts, however, will not become effective until Jan. 1.

The pricing action was attributed to rising costs of labor and materials and present market conditions which affect all phases of customer support, such as maintenance, technical assistance, customer training, and development of software, GE said.

The company also announced that present customer support policies in the area of systems analyst support, customer training, and software will be maintained.

GE will also continue its present policy of providing for a fee for special support services requested by the customer. This includes the services of GE's information management operation and the use of certain software application packages, such as the electric utility engineering programs.

While the policy of including a standard level of maintenance service in the basic use price will continue, customers will be offered greater flexibility in scheduling additional maintenance coverage, GE said.

The company announced it is revising its current equipment use pricing plans to provide a new plan under which unlimited use of the equipment will be permitted with additional charges only for additional maintenance expenses associated with extended use of equipment and/or additional maintenance service availability which the user may elect to schedule. There is also an across-the-board increase in the hourly rate for emergency maintenance.

"Extensive study was given recent competitive action regarding separate product pricing and its effect on the industry before reaching our decision," said Thomas A. Vandenberg, general manager of GE's information systems sales and service division.

DAA Delivery Delays Lead Users to Violate Tariffs

By Ronald A. Frank

CW Staff Writer

BOSTON — A simple data access device, marketed for use on private and leased lines can—and is being used to connect modems to the dial-up telephone network in apparent violation of communication tariffs.

Such improper use of the \$24 device was demonstrated at one of the sites where customers regard the unit as a way to avoid long delays for the card-to-get Data Access Management (DAA) equipment required by Bell.

The manager of a time-sharing company office said, "To us, time is money. We can't afford to wait up to six weeks for delivery of DAA equipment when we can get this device immediately. Also we can purchase the device for a one-time charge as opposed to a continuing monthly rental for the telephone company equipment." The non-Bell data access device consists of a miniature telephone jack together with associated wiring, all contained within the transmitter cartridge of a pulse phone headset. To install the unit, a user unscrews the mouthpiece from a standard telephone, removes the transmitter card, and replaces it with the

data access device, according to the manufacturer.

With the unit in place, the user attaches a miniature phone plug to the two-wire output connector coming from a data modem. This plug is then inserted into the jack, disconnecting the transmitter and making a direct connection to the telephone network.

Robert Capoletto, marketing manager of Data Access Systems Inc., Landing, N.J., said that his company designed the device primarily for private line telephone users, and independent telephone companies. He added that although it is a device of (Continued on Page 4)

DP Supermarket Opened in Los Angeles

LOS ANGELES — A data processing supermarket has been opened here by Granite Data Services Corp., a subsidiary of Granite Management Services, Inc.

The "market," called a Master Computer Center, contains a time-sharing bureau; a school to train programmers and systems engineers; a software division to develop customized and proprietary programs; a division for the marketing of unit record equipment, peripheral equipment, and, eventually, new com-

puter equipment; and a division specializing in the reconditioning and maintenance of computers for marketing.

The company plans to have satellite centers, each housing a service bureau, computer school, and equipment sales division in cities surrounding its major centers. These smaller units will also utilize the personnel, capabilities, and facilities of the larger centers. Plans are under way for the first units in East Los Angeles, San Diego, Orange

County, Calif., and Phoenix.

New York's projected Master Computer Center will be surrounded by satellites in Long Island, Brooklyn, North Jersey, and Philadelphia, a Granite spokesman said.

The Los Angeles center is the first of 12 master and/or satellite centers to be opened within the next 12 months, he said. A total of 50 centers will commence operations in key cities across the United States in the next three years, he said.

On the Inside

\$250, \$500 Disk Packs Offered for 2311, 2314

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Supernova Is Seen Superior in Speed, Applicability

By A.B. Williams

On our way to SOUTHBORO, Mass. — Supernova, son of Nova, is described by its maker, Data General Corp., as "the fastest of all the mini-computers."

The basic configuration, consisting of 4K of core (16-bit words) and central processor, is rack-mounted with a Teletype interface, and has been priced at \$11,700.

The new machine is scheduled for demonstration at the Fall Joint Computer Conference in Las Vegas, Nov. 18-20.

The speed is gained in three ways. First, core is speeded up to give an add time of 800 nsec, as compared to the Nova's time of 5.9 µsec. Second, the Supernova has a high-speed read-only memory (ROM). This optional,



The Supernova comes in this desk-top version and in a rack-mountable version.

extra-cost (but unpriiced, to date) feature, working in conjunction with accumulators, will cut add time to 300 nsec, the company says. The third feature, also optional, is hardware multiply-divide, also as yet unpriiced. The company feels that the

new elements will push Supernova into applications that Nova can't handle.

The instruction set is similar to that of the earlier model. The use of 16 bits as standard instruction length allows a large measure of versatility. For example, the add instruction can also be made to shift or skip.

The new machine will be able to use all programs written for the slower predecessor, according to the manufacturer. The company supplies an assembler, a debugging package, hardware diagnostic, a text editor, math routines, and a floating-point interpreter for the Supernova.

The main feature is ROM. While it is unalterable by program, and therefore cannot be used to store program-changed data, the procedural portion of a

program should benefit from the speed afforded by the faster response.

The company's current mix of shipments is approximately 70% OEM, so most peripherals are added (and interfaced) at that

level. Data General does, however, ship paper tape units and a flying head-per-track disk with a capacity of about 500,000 words.

Company offices are on Route 9 here.

Work on a World Model Should Begin Now: Editor

LA JOLLA, Calif. — Work should begin immediately on a computer model of the world, according to John McLeod, editor of *Simulation*.

"I don't think that I'll live to see it," conceded McLeod. But he said: "It's past time to get started."

McLeod explained: "I believe that much of the strife and unrest in the world today is the result of the improper handling of information. Improved communications have made available more information than can possibly be assimilated and evaluated by the human mind."

"I believe that the trend in world affairs is now such that our very survival might well depend on our... making proper use of the information available to us. But we cannot do this unaided; we must call on some of the same advanced technology which has contributed to the world crises..." he said.

McLeod's solution: "If those of us with the knowledge and the means should proceed with all possible vigor to develop a world simulation, I do not underestimate the magnitude of the task, but I believe that it must be established if we are to survive."

The purpose of such a simulation, he explained, would be to gain insight into complicated interactions. One possible use might be to find the best course of action to satisfy two opposing groups in a particular situation.

He stressed that a complete simulation was not necessary to get some benefits, and that the entire simulation might never be completed. But each step, he said, "will give an awful lot of insight."

In order to get started, McLeod is holding an invitation-only meeting (restricted to those who write him to express interest) at the Fall Joint Computer Conference.

He hopes that such a meeting will develop a "course of realistic action." Initial work, he suggested, would be to inventory existing simulations and to study their interactions.

Such small simulations would serve as building blocks for the larger world simulation. Typical building blocks might include one of the economy and another of smog control, and their interaction might give some information on the economic effects of smog.

Accuracy of simulations will be the biggest problem, he conceded. But McLeod said that he did not believe that anyone would ever assume that such a simulation is perfect.

McLeod can be contacted through Simulation Councils Inc., P.O. Box 2228, La Jolla, Calif. 92037.

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DAA Delivery Delays Cited

Users Turn to Other Equipment

(Continued from Page 1)
device being used in place of Bell DAA equipment, his company takes the position that it cannot legally control the use of the device after it has been sold to a data communications user.

The demonstration took place at an installation here where the access device interconnects a commercial multiplex-type data modem with a standard telephone.

When asked whether this particular use of the device was in violation of existing tariffs, Capoletta stated that both he and the user were of the opinion that it could be so interpreted. He added that more than a dozen similar installations now exist across the country.

An FCC spokesman told CW that when a common carrier believes that a violation of existing tariffs has occurred, the carrier reserves the right to cut off its service and/or file a complaint with the commission. He added that the FCC had received



The access device, attached to the handset, rests on top of a modem.

no complaint in regard to the device.

An AT&T spokesman in New York agreed that installations in place of DAA equipment for direct interconnection with the switched network would be in violation of existing tariffs. The spokesman was unable to comment on the Data Access Systems device, and stated that AT&T had no information concerning the unit.

Capoletta said that since it

was difficult in many areas to get delivery of DAA equipment from Bell, users were able to install the unit from his company as an interim measure. Also the device makes it possible for manufacturers of time-oriented, computer equipment to provide demonstrations at customer sites without having to wait for delivery of DAA equipment, he said.

He added that although the installation of his company's access device was being questioned from a technical compatibility standpoint, he saw no conflict. He said that in most cases the access device is used to interconnect to the telephone network a modem that has previously been approved as acceptable technically by AT&T.

Capoletta said that Bell should set up a technical approval system for all equipment that manufacturers want to connect to the switched telephone network. He said that such a system similar to the type-acceptance procedures required by the FCC for its licensees, would insure that all directly connected foreign equipment was technically compatible with telephone equipment.



Univac 2703 optical document reader

3-Way Reader Introduced For Univac 9000 Series

BLUE BELL, Pa.—A new Univac optical document reader, the Univac 2703, is designed especially to read numbers, symbols, and marks on turn-around documents.

It functions as an on-line input device to a Univac 9000 Series computer which controls its operation and processes and stores the data derived from documents.

The unit's basic speed is 300 six-inch OCR documents per minute. This may be increased to 600 OCR documents per minute by means of an optional speed-up feature. Character reading speed is 1,500 char/sec.

The 2703 sells for \$42,000 and up or may be rented for \$1,500 per month. First deliveries are scheduled for next summer.

A photocell array converts printed numeric information into electronic pulses. A solar cell sensing head reads vertical pencil marks or holes in punched cards. The 2703 also has twin-belt document transport and carousel stackers which can handle a document traveling at a rate of 150 in./sec.

Other features are a set of programming packages, built-in hardware for on-line or off-line test routines, and special software test routines, Univac said. The reader will scan documents from 3 to 8.75 inches long, and from 2.75 to 4.25 inches high. It recognizes numeric characters from zero to nine and special symbols in OCR-A or Univac 11-14 fonts, hand-printed vertical marks, and holes in punched cards.

Analog Controller/Plotter Offered As Less-Expensive Alternative

WALTHAM, Mass.—"Analog graphics is much less expensive, hardware-wise, and far less demanding of computer time than conventional point-to-point digital techniques" is the major claim made for a new device.

The C/P 701 controller/plotter takes digital output from a computer and converts it to analog. The user gets hard copy from the plotter and has the option of plugging in an extra-cost storage CRT.

Timeshare Devices of 225 Crescent St. says it will provide interface to any computer within the \$3,875 price for C/P 701. It will also provide on-ender maintenance. Delivery is stated to be 90 days after receipt of order.

C/P 701, which is quite similar to a device from Time Share



C/P 701 plotter

Peripherals Corp., Wilton, Conn. [CW, June 11], shares the time-sharing terminal's telephone line without affecting normal terminal operation, the company says. It can be used with all standard acoustic couplers and teletype terminals. Applications include interactive graphic display, teaching aid, engineering analysis, and medical analysis.

In-House Microfilm Is Retrieved With Aid of Remote T/S System

(Continued from Page 1)
will include the terminal, software, time-sharing system, microfilm preparation, system support, and maintenance. Minimum monthly charge of \$300 includes 4,000 records, with additional capacity available at 5 cents per record.

The company has established computer centers in Washington, D.C. and New York City. First deliveries of terminals are scheduled for November.

DSI also plans to offer a terminal containing only a numeric keyboard, to be used for requesting index data from the central computer and automatic

frame searching. Another hardware offering will be a stand-alone microfilm viewer.

30-Day Delivery Offered

DALLAS, Texas—The DCT-132 remote-batch communications terminal is available for 30-day delivery, according to Scientific Control Corp., the manufacturer.

The DCT-132 (CW, May 14), said to be compatible with the IBM 360, Univac 1108, Control Data 3000 and 6000 series, the Burroughs 5500, and the SDS Sigma series, costs \$21,000 for the basic system.

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Effects of Unbundling Will Be Covered At Second Law of Software Conference

WASHINGTON, D.C. — The effects of unbundling will be among the topics at the second annual Law of Software Conference to be held Oct. 8-9.

Other topics will cover the scope of copyright protection, suggestions for copyright protection, and Internal Revenue Service attempts to treat software development costs as capital rather than expense items for tax purposes.

The conference, to be held at the Statler Hilton Hotel here, is sponsored by the Computers-in-Law Institute of the George Washington University National Law Center.

After legal developments of the past year have been explored, the theme will shift to analyses by representatives from various segments of the computer industry of how these developments may alter both the nature and structure of the industry. Fol-

lowing this discussion, financial and security analysts will explore the effects which these ramifications may have on future investment patterns.

Luncheon speakers will be Commissioner of Patents William E. Schuyler Jr., who will speak on "Protecting Property in Computer Software," and Wallace C. Doud, IBM director of commercial development, whose topic will be "The Business of Software and Its Protection."

System for Taxmen Claimed To Cut Filing Time by 90%

WALTHAM, Mass. — A time-sharing system has been designed to allow professional tax consultants to cut "by as much as 90%" the time required to prepare individual income tax filings.

The vendor of the service, Multicom, Inc., expects to be able to handle federal, Man-

schuett and New York State, and New York City income tax returns by the first of next year on its two CDC 3600 computers.

Multicom, located at 400 Totten Pond Road, describes system operation as being quite simple.

Using a typewriter terminal, an operator can enter a client's data in random order, properly identified by a short keyword. The computer orders and edits the data and flags incomplete, inconsistent, and some forms of erroneous data for immediate correction.

The operator can utilize either a step-by-step set of instructions or automatic control, as she gains experience.

The first output is a full listing of data, in proper order. This furnishes the basis for full pre-treatment review.

Data may be changed, via the terminal, at any time before or after a return has been prepared. Full data can be held in the system, accessible only to the consultant, for as long as is required.

The system obviously depends on proper coding of the keyword, by which data is identified. This may be done during preliminary talks with the client.

The keywords themselves provide a checklist to basic tax data, the company says.

Multicom is quick to state that the system is, of course, dependent on the completeness and accuracy of the client's information.

Charges that Northeast Airlines acted improperly when its computerized reservation system caused overbooking have been supported by the Civil Aeronautics Board (CAB).

In June, Northeast's reservation system caused overbookings on a number of flights, and passengers charged that Northeast failed to inform them that they might be entitled to denied-boarding compensation, (CW, July 9).

Last week, the CAB said that Northeast "has, on numerous occasions... confirmed reservations for more passengers" than it had seats, and that Northeast had failed to provide passengers with the required written statement, telling them they could claim denied-boarding compensation.

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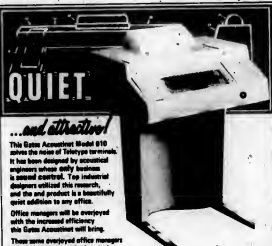
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Airline Rapped For Overbooking

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COMPUTER INDUSTRIES

\$250 Pack Offered for 2311, \$500 Pack for 2314

PHOENIX - Disk packs for IBM 2311 and 2314s, substantially less expensive than the IBM packs (even after the recent price cut on the Model 1316), are being manufactured by National Computing Industries.

The company's claims include:

- Packs guaranteed error-free upon first initialization.
- Delivery within 24 hours of order, in major metropolitan areas.

- Unconditional guarantee of freedom from defects in parts and labor for three years.

- NCI's price for the 1316-compatible pack is \$250, against IBM's recently-set \$360 figure. The 2316-compatible unit costs \$500, compared to IBM's price of \$650.

The 1316 is the pack for the 2311 drive, while the 2316 is used with the 2314 system.

The company, located at 3003 N. Central Ave., will also lease units and enter into purchase/lease-back arrangements for IBM units already in use.

Lease prices are quoted at \$6.85 per month for the 1316 and \$11.92 per month for the 2316.

Data Entry Device

HARWOOD HEIGHTS, ILL. - An inexpensive (under \$5,000) data entry device features key-



NEW PRODUCTS

board-to-cassette entry, verification visually on a CRT (or via teletype), and the capability to communicate directly with a computer.

The GTU-1 from Hypertech Corp. consists of six 100-character registers.

Two master registers are the focal points at which data is formatted, verified, and searched (for repetitive information).

Two program registers allow retention, for immediate use, of formatting and test-loading programs providing two different uses of the same input document. The remaining two registers handle input and output. Frequently used programs can be kept available on one of two cassettes included with the unit.

The company, located at 7343 Wilson Ave., says that text-handling with the GTU-1 represents a distinct competitive advantage.

It cites field definition, in which one symbol represents a programmed function, with no special characters for such things as beginning and end of field.

The company expects to begin deliveries by the end of the year.

Disk Drive

PHILADELPHIA - Univac now has available a 2314-type of disk drive.

The 5314 is similar to the IBM unit, except that the smallest available module has two drives, with single-module increments available.

Average access time is the same as the newer 2314's, at 60 msec. Capacity per drive is the same 29,176,000 bytes, going to the limit (eight active drives) of over 233,000,000.

The new unit has two features - record overflow (permitting records to be larger than one full track) and file scan (giving search of both key and



data areas) - which enhance its usefulness, says Univac.

The \$414 will be available first for use with Univac's 9000 series of computers, with initial deliveries to begin during the first quarter of 1970.

Later availability for the 1100 series is expected.

The minimum two-drive system, for use on the 9000s, is priced at \$1,990 per month on a one-year contract.

Purchase price is set at \$74,000.

The company address is Box 8100 here.

Magnetic Tape Unit

DALLAS - A magnetic tape unit that provides data interchange between Digital Equipment Corp.'s PDP-8 and IBM computers equipped with either 7- or 9-channel magnetic tape is scheduled for September delivery. Data generated or acquired on the DEC machine can be used,

without change, on IBM processors.

The company, Computer Equipment Corp., also cites the advantages of loading programs from magnetic tape as opposed to the more conventional paper tape. As an example, a time of 20 minutes is required to load DEC's Focal (a conversational algebraic language) from paper tape, as compared to a few seconds when using mag tape, according to the company. The unit consists of a CEC Model 640 controller interface and an Ampex Model TMZ transport, which uses a standard 2,400-foot reel.

The unit has a peak transfer rate of 10,000 word/sec using 12-bit words.

The controller, however, brings the transport to a full stop after each block is transferred.

This should be an impediment only when doing commercial-



type jobs, which require a constant flow of data through short, one-time program loops, says the company.

The firm will supply a standard software package with the controller, including a tape monitor, a modified Pal-III assembler, and diagnosis on the controller and tape transport.

The unit is priced to sell for about \$8,200. CEC is located at

3707 Rawlins Ave.

Punch Device

CARLSTADT, N.J. - Two bi-directional tape/edge punched card punches and two bi-directional tape/edge punched card readers with speeds of 50 char/sec are available from Automated Business Systems, a division of Litton Industries. The punches handle 11/16 in., 7/8 in., and 1 in. standard tape



by adjustment of variable tape guides and also accommodate 3 in. by 7 in. standard edge cards of 5-, 6-, 7-, or 8-level code structure.

The Model 400 basic punch mechanism and Model 418 desktop punch station are self-contained, with side-mounted take-up reels.

Overall dimensions are 5-1/2 in. long by 4 in. wide by 4-1/2 in. high. Both punch at 50 char/sec according to the company, located at 600 Washington Ave. Model 450 basic reader mechanism and Model 468 desktop reader station provide read stations sealed from dust, corrosion, and contaminants. Features include: adjustable guides to accommodate standard tapes and edge punched cards; bidirectional read and feed 5-, 6-, 7-, or 8-bit code at 50 char/sec; semi-automatic feed; and a side-mounted take-up reel.

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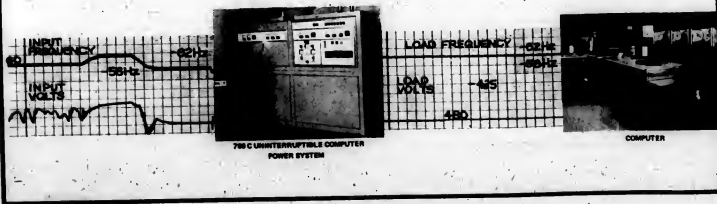
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Editorials

Poor Solution

There is little question that a device which allows anyone to alter a standard telephone for the purpose of hard-wiring a data mode to the switched telephone network is in violation of existing tariffs.

And although users, manufacturers, and even AT&T all admit that the current availability of data communications equipment from the telephone company leaves much to be desired, somehow the specter of bootlegged interconnections to the Bell System seems to be the worst solution to the problem.

The manufacturer of the access device has said that all those desiring to interconnect with the telephone network should be allowed to do so. This is obviously correct.

However, we emphatically feel there is more to the problem than merely meeting the demand for equipment from potential interconnection users.

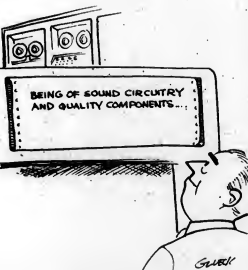
The switched telephone network has been entrusted to a common carrier and monitored by regulatory agencies to insure the right of access and use to everyone.

Before we are ready to applaud the introduction of a device that conceivably can allow anyone to transmit computer data wherever and whenever he desires, we would demand some assurance that this level of usage is compatible with existing telephone communications facilities.

There are already enough problems and enough complaints concerning the operation and service of the telephone network. Today's problems may well stem, from an inability of AT&T to anticipate and meet demands for usage. The answer probably will involve limiting AT&T responsibilities while fostering increased participation by private companies.

However, this type of decision should be made by those entrusted with the perpetuation of the system. The technical, economic, and legal ramifications are too great to ignore.

Otherwise the random use of a simple access device without adequate safeguards could come back to haunt us all.



Tree Inspection Needed



Letters to the Editor

Privacy Called Sensitive Issue By Nixon Administration Aide

The following is a reply to a letter sent to President Nixon. We asked why the legislation to set up computerized job banks failed to include the privacy protection specified by Nixon during his election campaign. Under Nixon's original proposal, applicants would have input only their qualifications, not their identifications. The President has asked me to respond to the very sensitive issue raised in your letter of August 20, 1969.

As editor of *Computerworld* you are, of course, aware of various devices for insuring the security of information in computerized data banks. While one or more of these devices could have been spelled out in the Manpower Training Act of 1969, it was our judgment that this would have added peripheral administrative detail to the customarily substantive provisions of legislation.

At some point in the applicant-job referral system, of course, the identity of the individual is indispensable. It is possible to maintain this in manual files locally, with only a code identification fed to the computer. Clearly, however, this would not be using the computer to the optimal extent. The question then becomes one of determining the point at which the operational needs of the system must give way to the need for privacy and security of personal information.

We are very conscious of the importance and the sensitivity of the privacy issue. The department's Manpower Administration has recently established a task force to examine every conceivable aspect of this difficult area. It will be some time, of course, before the task force is able to reach firm conclusions. We would welcome any thought you have on this matter.

Joseph A. Loftus
Special Assistant
for Communications

U.S. Department of Labor
Washington, D.C.

We disagree that the identity of the individual is indispensable. Under the original proposal, as we understand it, an inquiry would be made to the data bank via a terminal while the applicant waited. This is the way the Teletype stock service works. The person making the inquiry does not have to identify himself. Ed.

'Omnitab' Developed by NBS In 2 Versions, Reader Says

Your coverage of ITN's Omnitab [CW, Sept. 10] could leave the impression that the language is a proprietary creation of ITN. In fact, the two Omnitab systems were developed at the National

Bureau of Standards. The first, written in FAP and Fortran II for the 7090, is described in NBS Handbook 101. The second is written in standard Fortran and runs on the Univac 1108 under either Exec II or Exec 8, the IBM 360, and the GE 635. The novelty of a new Omnitab implementation would consist of its adaptation to a new computer or addition of new functions to the language. The description of the ITN Omnitab mentioned neither.

I would like to hear of other computers which have added Omnitab to their repertoire of languages.

Kenneth B. Weiner

Computer Command and Control Co.
Washington, D.C.

Upset User Says It's Too Early To Get Upset About 360/195

Are you kidding?

On page 1 of your Sept. 10 issue you quote an unnamed IBM spokesman as stating that on the new 360/195 all programs written for other large 360 models can be run without modification, except possibly (and I quote) only the second item in a list of three) user programs.

What else is there? We buy (or lease) computers to do our data processing work, and we write what is called user programs for this purpose. So what the said spokesman tells us is that all programs may (you substitute "will" for "may" in your comment on page 20, maybe you know more than we are telling) have to be modified.

It is too early to get upset over possible program modifications for a computer which is more than a year away from delivery. It would be nice if that were the only problem the user will encounter.

So let's quit tucking away important information in a list preceded by a very special case and followed by an even more special one. It was noticed anyway!

Walter J. Semeck

Combination Engineering, Inc.
Windsor, Conn.

Perhaps we had inadvertently "tuck it away," but we printed the warning. And that's the important thing, isn't it Ed.

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, *Computerworld*, 797 Washington Street, Newton, Mass. 02160.

Data Communications—Part V

Foreign Attachments Limited by Bell Access Equipment

By Ronald A. Frank

When the foreign attachment provisions for the interstate telephone network were approved by the Federal Communications Commission, two types of interconnection were foreseen.

The first involved nondirect connection by means of conventional telephone headsets placed on specially designed cradles or otherwise fitted with adapters that allowed acoustic coupling.

Many types of these acoustic couplers are being used today at remote sites to access computers. Since these devices do not directly connect to telephone company equipment, Bell can only insist that the devices are "type-accepted," meaning that they must be technically compatible with the telephone network.

The second type of interconnection involved wired interconnections to the switched network. Here Bell said technical compatibility had to be assured since foreign devices were being directly connected.

Accordingly, after extensive study, Bell said that a device to be rented and maintained by local phone companies would have to be installed between foreign equipment and the telephone network. This equipment is now officially designated as Direct Access Arrangement or DAA device.

As part of the FCC-approved provisions, two classes of DAA devices were set up, manual and automatic.

The manual DAA device allows an interconnection with a computer or other foreign attachment but human intervention is required. The procedure is similar to an operator answering a phone call and then connecting the called party. Tariffs for manual DAA devices have been filed in 46 states and the monthly charge for this service is about \$2 in most areas, according to AT&T spokesmen.

The automatic DAA device, however, is more important to the computer user since this arrangement permits automatic connection of a computer to the telephone network.

Even though the regulations allowing DAA devices are more than a year old, tariffs for automatic DAA devices have not been filed in any of the states covered by the Bell system. In all cases, present computer users of automatic DAA devices are paying monthly charges under separate assembly provisions of existing tariffs in the individual states, according to AT&T spokesmen.

When asked why automatic DAA tariffs had not been set or even filed in any of the states, an AT&T spokesman said that the industry installed equipment is considered to be interim in nature. The AT&T source further revealed that Bell is planning to issue modified automatic DAA tariffs in "1970" that will be cheaper to rent than the existing device. Presently installed automatic DAA devices cost comput-

er users about \$4.58 per month.

When asked whether the delay in setting tariffs for the automatic DAA devices had any relation to the continuing FCC inquiry into the technical aspects of computer interconnections to the telephone system, the AT&T spokesman said that to his

knowledge the expected new DAA equipment next year was the only reason for the delay.

Industry sources in data communications have expressed opinions that the automatic DAA device question will be raised as part of the FCC inquiry.

The National Academy of

Sciences has been asked by the FCC to form a study group to investigate all aspects of interconnection.

Hopefully the NAS study group and the related series of informal conferences being held by the FCC will define many of the problems currently facing

data communications users with in the computer industry.

Definition of existing problems, including their technical, legal, and economic aspects, will prove to be a major step in resolving the many problems now facing data communications users.

Black Trainees—Part II

Few Trainees Accepted Despite Programmer Shortage

By Joseph Hanlon

CW Staff Writer

BOSTON—There is a programmer shortage. So there must be a shortage of people who are not to be programmers, and underemployed black people should be groomed for jobs as programmer trainees.

Wrong! Despite the programmer shortage, companies are training relatively few new programmers. Competition is stiff, and the screening tests set against the black underemployed.

There is no shortage of people who want to be programmer trainees. In fact, some companies train 60 programmers per year. For its April class, it had 129 applicants and accepted 17.

One result is that college degree and high score on an aptitude test are mandatory. Consequently, despite special training, black people on Boston's ghetto can't get jobs as

programmer trainees.

Jobs are available as computer operator trainees. Several local companies report they have operator training programs that take the underemployed and underprivileged. Generally, these same companies noted that some requirements were waived for people already in the company, and that someone with "demonstrated ability" could be promoted to a position as a programmer trainee. But it is impossible to tell how much of this is actually done.

For those on the outside, jobs as computer operator trainees are available. Volunteers from

Arthur D. Little, a large local consulting company, taught nine-month course that met two nights a week. All students were high school graduates, and during the course they studied several Cobol programs. But all are black and lack college degrees. Of the 12 people who graduated from the course last June, only one got a job through normal channels as a programmer trainee. The first stumbling block is the lack of a degree. As the DFL manager from one of the large insurance companies put it: "A college degree isn't necessary, but when we can get people with college degrees, why take less?"

Tests are the next problem. Nearly all companies require an A on the IBM Programmer Aptitude Test (Pat), although one insurance company reported that it will probably stop using

it some companies require applicants to pass a general aptitude test before they are allowed to take the Pat.

Even companies that will waive the college degree requirement for graduates of this course require an A on the Pat. And people who graduate from this course do not do well, getting at best a B on the Pat.

Chuck Martin, organizer of the course, charged that the IBM test is "culturally biased." Further, he argues that tests in general are discriminatory, because test taking is a learned skill. "College students are experienced test takers," he noted. "These people have less experience, and therefore are poor test takers."

A teacher in the course charged that "personal people use tests as excuses for making decisions not as side. You can't give our people tests; normal tests don't apply. Our people should be judged by the programs they have written."

(Objections to the Pat have risen elsewhere as well. The ACM Program Research Group charged last year (CW, Nov. 12) that people who score a B are more likely to be good business programmers than people who score A. In the study, respondents were asked to rate the programmers who were in the top half of their staff. Of those who scored B 64% were rated in the top half,

compared to 51% of those who scored A, and 42% of those who scored D.

Image may be a problem, too. "People seem to have a pretest mental image of what a programmer should look like, and those people don't fit the image," declared Martin.

Without realizing it, the teachers of the course may typify the problems their students face.

Two of the people from the course were finally hired by one of their teachers at Arthur D. Little (ADL). He proudly stressed that he had not hired them out of charity: "During June and July, three of my people quit. These girls had proven themselves. I knew they had the basic native intelligence and the desire to do the job."

But he admitted that if he had not known them personally, he would not have hired them.

He also noted that ADL has a programmer shortage, but when asked about the possibility of ADL hiring other course graduates, he said: "ADL is a bad example. We are a consulting firm and need experienced people. This is a high school for a junior person; we have no time to train them."

Despite claims of success by the teachers, others in Boston have questioned the adequacy of the course. In the concluding section of this series, CW looks at the course itself.

U.S. Government Offers Little to Underemployed

WASHINGTON, D.C.—The federal government, traditionally a haven for minority groups, offers little hope for the underemployed black who wants to become a programmer.

As in private industry, the federal government has often required a college degree for programmer trainees. And like private industry, the government has many applicants and few training openings. Unlike private industry, however, programmer turnover in the government is low, which further reduces the number of openings.

Statistics are hard to come by, but it appears that the federal government hires several hundred programmer trainees each year. All applicants for non-scientific professional trainee positions with highest test scores (most computer programmer trainees) must take the Federal Service Entrance Examination. This test is designed for people with college degrees, and is taken by many more people than are finally hired. Trainees are then selected from among those with highest test scores.

Programmer trainees are hired at grades five and seven, which requires a college degree or three years of equivalent work experience. That is, they are in a "progressively responsible" position, and excludes "routine clerical" jobs such as keypunching.

The equivalent work experience can be gotten at lower levels in the federal government, and some agencies, notably the Internal Revenue Service, promote from within to positions as programmer trainees. People who are promoted from within do not have to take the Federal Service Entrance Examination.

One possible route for the underemployed is the Junior Federal Assistant (JFA) Program. This is designed for people with two years of college or two years of equivalent work experience "who have demonstrated potential for higher jobs." These people are hired at grade four, and groomed for rapid promotion.

Persons interested in computer programming would enter the JFA Program as computer technician, a job that includes coding, flowcharting, and program updating.

JFA candidates are scored systematically, based on a combination of education, experience, and test score. Because of the nature of the automatic ranking, credit for computer courses is determined only by the length of the course.

Openings are limited. Between July and December 1968, 10,000 passed the JFA exam, 980 were selected, less than 1%. Of those 980, 50 were computer technicians.

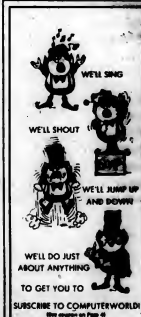


Illustration by Page 6

Computers and the Public Interest

Kemeny Calls for National Time-Sharing Networks

WASHINGTON, D.C. — John G. Kemeny, codveloper of Basic, called for the creation of nationwide time-sharing computer networks as a critical step in harnessing technology to the service of society.

In remarks prepared for delivery at the inaugural session of "Computers, Communications, and the Public Interest," a lecture series organized by Johns Hopkins University and the Brookings Institution, Kemeny predicted, "Modern technology will make it possible to restructure society so as to make life pleasanter and more meaningful for man."

"I think that we will not experience the ultimate impact of computers on society until computer terminals are not only in business, research, and educational institutions, but also are commonly available in the home," he said.

If business can be conducted by means of computer — allowing instant communication and data recording and retrieving on a worldwide basis — modern man will not have to infest large urban sprawls, now the breeding ground for most social ills, he said.

To accomplish the use of large time-sharing systems on a national scale, Kemeny made three recommendations as to national policy towards the computer.

First, better methods of forecasting computer use must be developed — to allow the communications industry to keep pace with an increasing demand.

Second, the budget of the National

Science Foundation should be increased by \$100 million to fund the support of computer education. "I predict," Kemeny said, "that within a decade the federal government will find this one of its most profitable investments in terms of the vast expansion of the economy and the resulting revenue for the federal government."

Finally, because the research and development needed to establish such a large-scale system are beyond the means of any local or state government — and may not be profitable enough to attract the attention of commercial companies — Kemeny called for the creation of a national computer development

agency which would have as its mandate the development of hardware/software systems needed to implement time-sharing systems on a large scale. Kemeny proposed that an initial appropriation as small as \$5 million would be sufficient to establish a staff and computer system necessary for initial experiments. States, municipal governments, and public and private agencies (such as universities) could then join as members by paying a per capita fee.

As the years progress the development of newer and more useful systems could then become routine.

Kemeny concluded, "I am not naive enough to think that computers alone will solve the problems of society. How-

ever, I am convinced that social problems have become so complex that, without the use of the best available computer technology, we are helpless in the face of social problems."

The seminars, held in the auditorium of the Johns Hopkins University School of Advanced International Studies, will continue Oct. 9 with the second in the series, entitled "Designing Organizations for an Information Rich World." The speaker will be Dr. Herbert A. Simon, professor of computer science and psychology at Carnegie-Mellon University. The seminars are funded by grants from the Alfred P. Sloan Foundation and the American Society of Information Processing Societies.

2-Day OCR Symposium Is Set for Oct. 14-15 In Washington, D.C.

WASHINGTON, D.C. — A two-day symposium on optical character recognition in government and industry will be held in the Department of State West Auditorium Oct. 14-15.

The symposium will be sponsored jointly by the National Bureau of Standards and the National Archives and Records Service in cooperation with International Business Forms Industries, a Washington-based industry association. Half of the 850 seats will be allocated to representatives of the federal government, the other half to industry representatives.

The program will include sessions on OCR and management information systems, a market survey of forms and computer input, OCR technology review, case studies of both government and industry installations, OCR standards, OCR forms production, OCR forms design, and a panel discussion by seven company presidents on OCR in the '70s.

A seminar summary will be presented by H.R.J. Groesch of the NBS Center for Computer Sciences and Technology.

Interested government personnel may contact: M. Osmond Newgard, Room 602, National Archives and Records Service, 5th and Pennsylvania Avenue N.W., Washington, D.C. 20408.

Industry representatives may contact: John deMasi, International Business Forms Industries, 3223 River Road, Washington, D.C. 20016.

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DP Jobs Added to Annual Study

U.S. Labor Department Makes Survey of DP Salaries

WASHINGTON, D.C. — Computer operators in the top classification (class A) averaged from \$159.50 a week in Chicago to \$133.50 in Dallas, according to a series of studies conducted in 10 areas by the Labor Department's Bureau of Labor Statistics.

The studies were conducted to test the feasibility of collecting salary data for computer jobs on an all-industry basis. The jobs surveyed were systems analysts, programmers, and computer operators for each occupation, salary information was collected at three levels of job complexity.

The survey in each area covered private industry establishments in manufacturing; transportation, communication, and

other public utilities; wholesale trade; retail trade; finance, insurance, and real estate; and services. As a result of the studies conducted between last September and April, BLS plans to add these data processing jobs to the list of white- and blue-collar jobs studied annually in 90 areas.

This decision was made because the studies showed these jobs are easily matched with jobs available in industry, a BLS spokesman said. In addition, in the past few years, many private firms have expressed great interest in these and other computer-related occupations, he said.

Average weekly pay for top systems analysts — the highest-paid job in the survey — ranged from \$275.50 in Los

Angeles to \$203 in Jacksonville. Employees in class A worked independently, or only under general supervision, on complex problems.

Programmers in the highest classification averaged from \$228 a week in Los Angeles to \$164 in Cincinnati. Average weekly salaries of workers in the lowest programmer category (class C) in these two areas were \$158 and \$132.50, respectively.

Men accounted for substantially more than half of the workers in all of the occupational classifications and areas studied and for three-fourths or more of the workers in all but a few instances. Women were most frequently employed at the lower levels of work.

Copies of the descriptions used to classify workers in various jobs may be obtained from the Bureau of Labor Statistics in Washington, D.C., or from its regional offices.

Detailed Information Indicates Limitations Of Call/360 System

WHITE PLAINS, N.Y. — The software for Call/360 OS, announced recently [CW, July 9] by IBM, will be free, IBM said. It is considered an enhancement of an existing TSO program.

Additional details of the system, which supports Basic, Fortran, and PL/I, recently became available.

Advanced features such as bit manipulation, structured variables (the technique for defining data as it is defined in Cobol), string manipulation, and advanced I/O processing are eliminated from the Call/360 version of PL/I. Other limitations include the Fortran statements ENTRY, RETURN (in a main program), labeled COMMON, logical data and operators, and the debug facility. Direct access I/O is eliminated from both languages.

Advantages include an excellent common language; simple instructions, even though there are many instructions in the group of those possible; and straightforward program development.

The interfaces necessary to make the system workable are quite complicated, but only the operating system need consider them, since no assembly language programming is supported. Partitioned-sequential data sets are used for library management, providing an excellent support library for source and executable programs.

The Fortran compiler is a combination of the Fortran IV and the ASA Fortran compilers, with the above mentioned limitations as well as others. The PL/I compiler most closely resembles the PL/I D compiler used under DOS, but it does possess a few of the PL/I F compiler capabilities. A core memory optimization algorithm has been developed that permits the dynamic allocation and freeing of core by the executive, thus reducing the core needed by a given user at a given time.

The system, which requires a minimum 348K memory, is scheduled for release in the second quarter of 1971.

12-Month Leases Offered On Redcor EDP Systems

CANOGA PARK, Calif. — Redcor now offers what it says is "the lowest-priced 12-month lease rate in the mid-mini computer market."

Dallas L. Talley, vice-president, marketing, said Redcor's rates are comparable to those offered by large-scale computer manufacturers.

"The lease plan is based upon a rate of 3% of the list price per month for computer and computer products and 3-1/2% for special items, multiple and RC 745 and 785 data acquisition systems," Talley said.

"The plan includes an option whereby 50% of lease payments may be applied toward purchase," he said.

As an example, he said, the RC 70 computer system, with an 8K memory, an 860-nsec cycle time, multiplies and divide, memory parity, memory protect, hardware index register, real-time clock, and power fail-safe, lists for \$21,500 and can be leased for \$645 per month, with 50% of that rate applied to future purchase.



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National Academy of Sciences Explores Data Interconnection

By Ronald A. Frank
CW staff writer

WASHINGTON, D.C.—The Federal Communications Commission has requested the assistance of the National Academy of Sciences to explore technical factors involved in the interconnection of foreign attachments (including computers) to the switched telephone network.

The study will be conducted by a committee of experts headed by Lewis S. Billig, technical director of communications at the Milt Corp.

In discussing the work of the committee, Billig said that the study will be conducted by a panel of "12 to 13 experts" selected primarily for their technical competence.

Billig emphasized that the committee will deal exclusively with the technical, and not the legal or economic factors of the problem. In order for the committee to evaluate the positions of interested parties, the NAS committee has requested detailed papers from about 90 individuals.

The primary function of the committee, according to Billig, will be to determine whether the present tariffs (those which originated as a result of the Carterfone decision) adequately provide for the protection of the telephone network from harm arising as a result of the interconnection of foreign attachments.

ments.

In addition the committee will attempt to "define how existing or projected interconnections will affect the switched message network."

It is expected that computer time-share users and others affected by the technical aspects of interconnection will submit position papers and participate in the study.

The first meeting of the NAS group, September 25, will be introductory and exploratory.

Parties interested in presenting position papers should communicate with Warren Howe, chairman of the computer engineering board at NAS here.



COMPUTERWORLD

communications

Time-Share Group Favors Nonregulated Facilities

ANN ARBOR, Mich.—The Computer Time-Sharing Services Section (CTSS) of the Association of Data Processing Service Organizations, Inc. (Adaps) has filed a response to the recent recommendations of the Stanford Research Institute concerning the interdependence of communications and computer services and facilities.

The SRI report, a seven-volume study, was undertaken at the

request of the Federal Communications Committee. Two major recommendations of the report directly affected computer time-sharing users.

The CTSS response basically agreed with SRI that message-switching-type data should not be regulated by the FCC. Message switching is generally defined as data transmitted over the common facilities of the AT&T network, as opposed to data transmitted over private wire facilities.

The CTSS group did not agree with the SRI recommendation that consideration should be given to allowing common communications carriers (such as Bell telephone) to engage in the data processing business.

In discussing this aspect, John Ulendack of ComShare Inc., a member of the CTSS group, said that unfair competition arising from such a move was a distinct possibility.

Ulendack said that private firms within the computer industry must contend with high research and manufacturing costs, while common carriers can more easily absorb these factors within their overall operations.

The CTSS response is part of the continuing FCC inquiry into varying aspects of the computer and communications industries.

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Satisfied users include Fidelity's Fund Insurance Co., Crown Central Petroleum, FMC Corporation, Connecticut Savings Bank, James Abbott, Inc., Loeb-Rhodes, Tractor Computer Corporation, and the largest service bureau corporation in the United States, among others.

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Page 13



Lumberjack is shown being used in conjunction with the Selectric I/O typewriter for processing orders and deliveries. The computer was developed by Clary Datacomp for this specific application. The unit shown at the left is the paper-tape reader/punch.

Building Materials Firms Offered Bookkeeping Aid

SAN GABRIEL, Calif. — A desk-top computer in conjunction with software developed specifically for building materials dealers and wholesalers combine to form Lumberjack. The system maintains a current price and profit file for all such materials and is available from Clary Datacomp Systems, Inc. Daily cash flow reports, itemized sales-volume reports, and an on-line pricing and inventory maintenance system offer users the ability to efficiently utilize buying power, the company says. The computer consists of a normal numeric ten-key input plus input/output over a Selectric typewriter with front-feed carriage in alphanumeric mode. The company claims the soft-

ware was developed in conjunction with industry associations within the building trades.

Calculations available include automatic conversion into board feet, square feet, linear feet, bundles, or special units.

Computer entries are done line-for-line to permit visual matching.

The charge program posts sales, credits, and payments to receivables ledger, as well as handling inventory transfers and merchandise depreciation, the company claims.

The package is available, according to the company, in several size or lease plans starting at \$65 per month.

Company offices are at 404 Junipero Serra Drive.

Time-Shared Cogo Available From ITT

PARAMUS, N.J. — A time-shared version of Cogo, a program used by civil engineers in solving coordinating geometry problems, is available from ITT Data Services.

The new Cogo program features a simple vocabulary of 69 terms commonly used by civil engineers to describe their problems. This vocabulary precludes the need for engineers to have computer programming experience, previously a major obstacle to their use of computers. Conventional Cogo enables civil engineers to utilize remote typewriter-like terminals linked to centrally located computers for automatic solution of problems involving complex calculations used in land and right-of-way surveys, highway design, bridge geometry, regional planning, and subdivision analysis. With the new version, engineering firms subscribing to the time-sharing service have the capability of solving problems involving large amounts of data with a greater degree of speed and precision.

An extended file capacity enables users of Cogo to store up to 9,999 coordinate points and up to 50 curves.

• This feature gives the engineer

the capability of handling larger problems without the need of re-entering needed point coordinates.

It also eliminates the requirement for creating multiple files, which is necessary with other time-shared Cogo programs.

The Cogo program automatically performs calculations otherwise done manually.

Previously, a surveying team would spend from a half to a full day making calculations for each day spent in the field. With the

1400 Programs Converted for 360

BALTIMORE — A conversion system that claims to convert all IBM 1401, 1440, and 1460 programs to System 360 assembly language is available from Convert-A-Code Corp.

According to the company, the service has been used by major insurance companies, banks, brokerage firms, manufacturers, and service bureaus.

The company says that key elements of the Convert-A-Code system are a series of powerful translator programs in addition to a staff of conversion specialists.

Operational Software Analyses Included in Expanded Service

By Peter L. Briggs
Civ Software Editor

NEW YORK — Software Packages: An Encyclopedia Guide, a complete cross-referenced guide to available proprietary software published by System Interaction Corp., has been expanded to include operational analyses reports for software packages listed.

New listings include those IBM software packages that have been priced separately, the company says.

The price tag for this complete service, updated quarterly, is \$500 for one year, with succeeding yearly updates priced at \$400 per year.

Without operational analyses, the basic publication and updated material for a year sell for \$185. Quarterly updates may be obtained for \$125 per year thereafter.

Individual reports are available in minimum groups of five operational analysis reports, to subscribers of the basic guide for \$10.

The company, located at 8 W. 40th St., has developed its own staff of evaluators whose full-time function is to perform these analyses and keep them updated as the specifications and capabilities of each package change, according to Richard Hest, company president.

Typical Report

A typical report on Bole & Babbage's configuration utilization efficiency package contains

time-sharing service, this calculation time can be reduced to less than one hour.

The entire coordinate and curve table can be stored on the system and may be retrieved for future reference or later calculations.

RTS Cogo provides users with accuracy of up to 16 digits, compared to the 12- or 9-digit precision of other time-shared Cogo programs, the company says.

The company address is Box 402.

a brief description of the product capabilities, a detailed input and output description, a description of the processing techniques used, core requirements for specific modules and capabilities, and a discussion of differences observed between various versions of the product.

In addition to the comprehensive information contained regarding the software itself, an index of manufacturers, software available by machine/model, and the keyword and code numbers for the packages are cross-indexed to simplify retrieval.

System Efficiency Check Available to 360 Users

WHITE PLAINS, N.Y. — IBM is offering S/360 customers a service for measuring the efficiency and performance of data processing systems.

Known as Systems Measurement Instrument, the service consists of manpower, software, and hardware measuring devices and sells for \$1,800 for the basic five-day package.

"A user can record moment-by-moment activity in various components in its installation without significantly disrupting normal data processing operations. The data gathered can subsequently be analyzed using a special IBM data analysis program," says IBM.

The company says that this is

the latest in a series of measurement devices first used with the 7090 systems back in 1961.

The apparatus can be attached to the central processor or to other components of the S/360, the 1130, and the 1800.

The basic agreement includes five consecutive days' use of the instrumentation, technical assistance for attachment to the computer, and the use of a computer program for data analysis.

The IBM systems engineer will be provided for three days, the company says, to help develop the measurement plan, to instruct the user in the operation of the equipment, and to assist in review.

Magnetic, Gravitational Anomalies Interpreted by New Program

HOUSTON — A new geophysical program, Blackgold, to aid in the interpretation of magnetic or gravitational anomalies, has been released by Hub S. Ratliff Consulting Co.

Designed, the company says, to yield high accuracy in minimal computer time, the program has been written for the RCA Spectra 70 or SDS Sigma series computers and can be easily altered to other systems.

Apparently, the smoothness of the continuity of magnetic or gravitational fields can have a serious impact in the location of oil reservoirs and ore bodies.

The data is recorded in summary onto concentric circular

graphs, and coefficients are applied to each circle on the graph.

The manual repetition involved in this process has long been a source of serious errors, the company says, and the computer can significantly improve the accuracy of such graphical analysis.

The program will accept any group of coefficients and can be used for either upward or downward summations of field intensity.

The program detects inconsistencies in the input and flags the output accordingly, the company claims.

The company is located at 3600 W. Alabama, P.O. Box 22487.

Collins Offers Its Design Service

DALLAS — Collins Radio customers now have access to the company's computerized design and production service through terminals either at Collins or installed at the customer's site, according to the company.

The service is designed to automate the production and preparation of MOS/LSI arrays at a low price, the company claims.

The system has been in use within 60 companies for the last 17 months and offers an average of 60-day turnaround from design to production.

Digital testing data, array assembly specifications, and MOS

packaging are all handled through the system, according to Collins.

The process includes automatic functional testing provided under the company's digital pseudorandom inspection package.

Collins is located at 1200 N. Alma Road.

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New Literature

Digital Equipment Corp. has published a 22-page color brochure giving the specifications, features, and general descriptions of the FDP-8/I and FDP-8/L general-purpose computers. Included are details on the related available software, options, and peripherals. Write to Department F, Digital Equipment Corp., 146 Main St., Maynard, Mass. 01754.

A twelve-page brochure that describes the 150 magnetic data inseriber, a key-to-tape data entry machine for off-line data preparation, is available from Data Action Corp., 4575 W. 77th St., Minneapolis, Minn. 55435.

Worldwide Computer Services, Inc. at 280 N. Central Park Ave., Hartsdale, N.Y. 10530, has published a two-color brochure describing its services and proprietary software packages, including Teletext and Clip.

Catalog 445, featuring the complete line of microform storage equipment and detailing specific equipment for high-density storage and filing of aperture cards, microfilm rolls, cartridges and boxes, and microfiche, may be obtained from Tab

Products Co., 633 Battery St., San Francisco, Calif. 94111.

Creative Logic Corp. has issued an eight-page brochure describing its various computerized services for banking. Copies are available from the company at 80 E. Ridgewood Ave., Paramus, N.J. 07652.

Let's Get Personal is a folder from ASC Tabulating Corp. describing personalized computer-produced letters. The folder includes sample letters and may be obtained by writing the company at 1080 Green Bay Road, Lake Bluff, Ill. 60044.

Systemation, Inc. has issued a bulletin describing its 25-week, on-the-job training program. Titled The Basic Systems Course

for Programmers, the program covers 17 major areas of systems analysis. Write to Systemation, Inc. at P.O. Box 730, Colorado Springs, Colo. 80901.

A new folder from Tel-Tech Corp. presents information on the company's TT-103 data set, which the company says can be built into most terminals. Contact Tel-Tech Corp., 9179 Brookville Road, Silver Spring, Md. 20910.

A pocket-size pamphlet from CTC Computer Corp. outlines its consulting and programming service for numerical control systems. Write to the CTC Software Systems Division, 1018 Palo Alto Office Center, Palo Alto, Calif. 94301.

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Education

Honeywell Adds DP Course For High School Grads

By Kate Rachstein
CW Staff Writer

WELLESLEY HILLS, Mass.—A nine-month course designed to prepare high school graduates for jobs in programming and computer-related systems analysis will be initiated in November by Honeywell.

Meeting three evenings a week for a total of 475 hours of instruction, the first class of 25 students will include laboratory work, lectures, and case studies. They will also have opportunities to gain hands-on experience and can supplement their classroom work by using Honeywell's equipment in their spare time.

Although a high school diploma is the minimum entrance requirement, program manager John McMurrer said that the instruction would be geared to those with some college or business experience.

"We really are looking only for the exceptional high school graduate," he said. All applicants will be given the company's standard aptitude test.

The course is the second offered in Honeywell's new educa-

tion program; the first, begun in June, was for college graduates. The company currently plans to hire one of the course's 37 September graduates.

Hoping to train 1,500 students over a three-year period, Honeywell says that the course will qualify students for jobs at the level of junior programmer or higher. "We intend to give them respectable EDP credentials," said McMurrer.

At the present time, instruction will be exclusively on Honeywell equipment, he said, adding that future courses may include use of other hardware. Asked if he felt that students lacking college degrees would be handicapped when job-hunting, McMurrer noted, "Our experience has been that a degree is not a requirement for success in data processing."

Honeywell has not yet agreed to hire any graduates of the course, but said they had indications from "other companies" that jobs would be available for people with this type of training. Faculty members will be chosen from among those in Honeywell's EDP division involved in data processing instruction.

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Customs Bureau Trains Employees In Systems, Computer Techniques

WASHINGTON, D.C.—Skill in both customs operations and systems analysis is the goal of a program being offered to 19 employees of the U.S. Bureau of Customs. Hoping to develop management and computer techniques that can accommodate rapidly increasing workloads, the bureau plans to train personnel in statistical analysis, flowcharting, systems design, hardware evaluation, and programming.

Center for the project is the bureau's national training center at Hofstra University, Hempstead, N.Y.

Rather than train EDP experts in customs operations, the bureau decided to recruit potential systems analysts from its own ranks.

The program includes a com-

bination of features. By special agreement, the American University, Washington, D.C., is conducting some college courses in systems analysis. Augmenting these are bureau-directed courses in management studies and applications, and seminars on customs problems.

During the first phase, trainees studied basic programming and data processing, statistics, logic, and management functions. Advanced training will include interviewing and research techniques, systems design for business operations, report writing, and advanced programming and systems classes. The course will conclude with a series of seminars and workshops.

Director of training and career development is James J. Doherty.

1401, 1410, 1440 FOR SALE

IPS has several IBM 1400 series systems for sale or lease. Included are a 1401 40K tape system and 80K CPU, 1401 4K and 8K card systems, 1401 8K to 16K tape systems, 1401's with 1311 discs. Inexpensive 1401 D-3 (tape-to-printer only) deliverable in 90 days. These 7330 tapes available separately to add tape capacity to 1410 or 1401. 1440's with 8K to 16K core, 2 to 5 1311's. For price, delivery and detailed specifications, please write or call.

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Societies

Hardware and Software Highlight Discussions at ISA Conference

CW Staff Writer
HOUSTON — Data handling and computation will be the focus of attention at the 24th Annual Conference and Exhibit of the Instrument Society of America.

Four of the 39 technical paper sessions and one of the seven panel discussions will be directly concerned with computer hardware and software.

Other sessions on process control will reflect computer applica-

tions in instrumentation.

Topics to be included are: practical aspects of computer control, hardware/software trends, computer system design trends, and computer system project management.

More than 15,000 instrumentation specialists are expected to attend the conference and exhibit to be held at the Astrohall, Oct. 27-30. ISA officials report that the exhibit has been sold out since June.

MINNEAPOLIS — Improving the performance of organizations through the use of information technology that links the management sciences and the computer sciences was the challenge set forth at the Founders' Conference of the Society for Management Information Systems, Sept. 8-9.

"We must view systems problems from the vantage point of top management, and we must concern ourselves with the way in which computer resources are employed everywhere in the organization and with the harmonious interfacing of diverse systems within the organization," said Robert V. Head, president of the society.

Six projects, already approved by the society's executive council, were presented to the conference: personal data systems (the use of executive consoles); the orderly collection of existing management information systems literature; the construction of a policy guide for MIS; the investigation of problems within various intergovernment management information systems; a study of database management; and a study of the process of systems development.

In addition to Head's address, attendees heard five major technical papers, and addresses by Rep. Jack Brooks; Terrence Hanold, president of Pillsbury

Corp.; and Gayford Freeman Jr., chairman, First National Bank of Chicago.

The final session dealt with "Trends in MIS Technology." Frederick G. Withington of Arthur D. Little predicted a 10- to 20-fold improvement in computer cost-performance by 1979. High-speed memories will experience a similar improvement. Computer architecture will not change significantly, although greater use will be made of specialized hardware to replace software functions, he said.

Peripheral file storage devices will still be largely electromechanical, but an increase in packing density will permit billion-byte files in an average access time of 50 msec at a cost of perhaps \$300,000.

Withington believes that no technically new software will be required for MIS. Rather, the emphasis will be on reliability and convenience. This will carry a price in efficiency, with the result that much of the gain in hardware performance will be lost.

Withington stressed the need to maintain compatibility with earlier computers in order to preserve programs across hardware generations.

SMIS was founded in November, 1968, by a group of executives and management information system professionals.

Aflips Has SJCC Proceedings Now

MONTVALE, N.J. — Proceedings for the 1969 Spring Joint Computer Conference, containing 112 papers covering 30 technical sessions, are now available from the American Federation of Information Processing Societies (Aflips).

Included in the papers is coverage of topics ranging from computers and the underprivileged, computer systems v. health systems, and computer-aided instruction to on-line business applications, time-sharing systems, and software.

The volume may be obtained from Aflips Press, 210 Summit Ave., Montvale, N.J. 07645. Price is \$11.10 per copy for members of Aflips constituent societies and \$22.20 for non-members.

Adapso Welcomes New Member Firm

PRINCETON, N.J. — Applied Logic Corp., whose coast-to-coast ALCOM time-sharing network provides direct user access to computer systems in Princeton, has been named to full membership in the Association of Data Processing Service Organizations.

The firm will belong to the computer time-sharing service section of Adapso, which acts as a clearinghouse for exchange of information on data processing.

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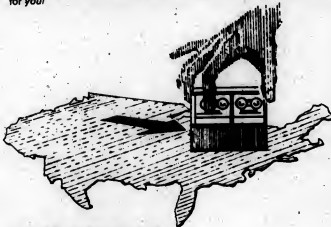


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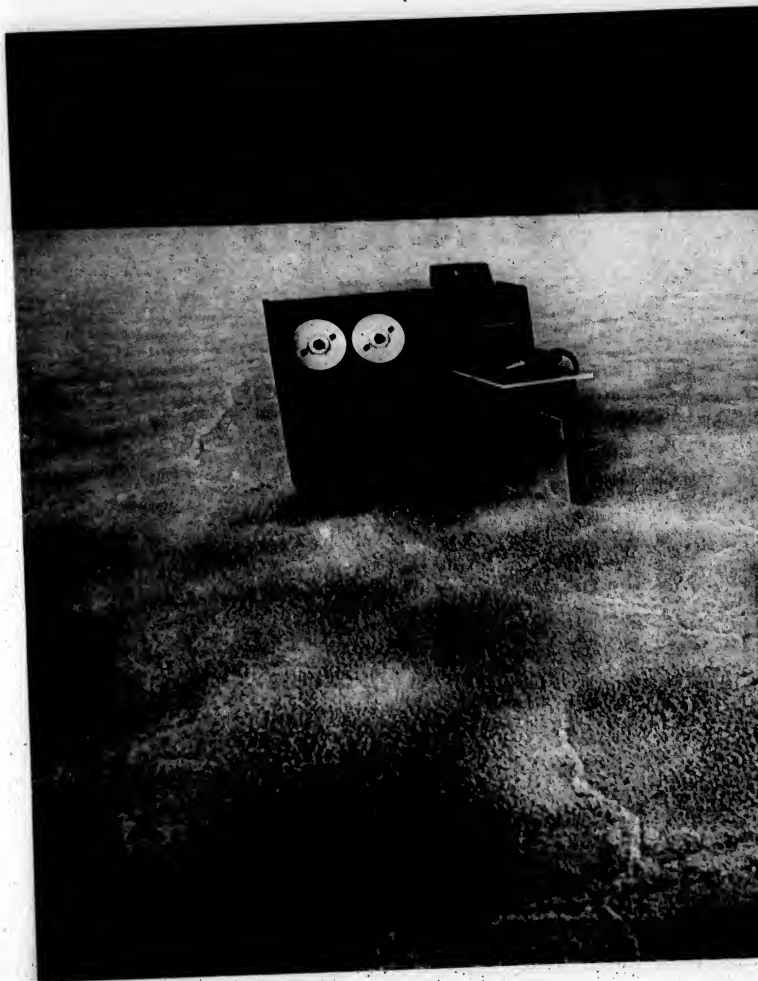
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Oct. 8	Sept. 26
Oct. 15	Oct. 3
Oct. 22	Oct. 10

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Nov. 19	
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Retailers are stocking the boots their customers want as a result of computer studies being made by the Acme Boot Co.



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Boot Fashion Preferences
Analyzed With Computer

CLARKSVILLE, Tenn.—A bootmaking company here is using a computer to determine the buying preferences of customers across the country.

To make sure that retailers have boots preferred by their customers, the Acme Boot Co., Inc. is using an IBM 360/30 to chart sales by climate, type of store, colors sold, and demand.

"By accurately charting the de-

mand for each of our more than 350 styles," said Leon Green, Acme vice-president of marketing, "we can spot trends toward new fashions in footwear."

"With the computer reporting regional preferences in sizes and styles, we are sure to have a particular boot in stock when and where it's needed," he added.

By identifying the most popular styles and fashions, the computer-aided market study already has helped establish a new line of boot that Acme says has won acceptance in every part of the country.

In addition to market studies and forecasts, the company uses its computer to schedule production runs and keep track of its inventory, which includes warehouse stocks of more than 1 million pairs of boots.

As a result of its market analysis, the company has learned that seasonal factors such as cold weather have a definite effect on the buying habits of its customers.

To pinpoint these factors, the company analyzes sales by county and metropolitan area.

Production at the company's five factories, according to size and style of boots, is scheduled by the company data processing center, with information based on current buyer preferences and sales figures from comparable previous periods, according to Glyn Broome, director of data processing.

Finished goods cost breakdowns plus material and labor costs are also run on the computer, said Broome.

"With our computerized production projections, we are able to anticipate our future demands for leather and other materials," Broome added.

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Under general direction, designs microprogram logic, basic compilers, utilities and programming languages for Friden EDP products based upon hardware specifications. Works at the highest level of all technical phases of programming in providing the more complex software and in giving occasional guidance to less experienced programmers classifications. Reports to Software Development Supervisor.

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Senior Applications Engineer

Under general direction, formulates hypothetical solutions to business, scientific and/or engineering problems as required by the Product Line Manager. Prepares procedures and programs for problem solution, software package offerings and language testing. Provides the "real world" interface in software development and gives guidance to less experienced programmer classifications. Reports to Applications Engineering Supervisor.

Systems Writer

Under the general supervision of the Technical Documentation Supervisor, prepare accurate and complete written documents, suitable for publication, that describe and detail the software, higher level languages and simulators used with Friden EDP equipment and other major computers.

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Dangerous Highway Locations Detected By Maine's Vehicle Accident Data Bank

By Ronald A. Frank
CW staff writer

AUGUSTA, Maine—Motorists involved in motor vehicle accidents at major intersections in this state automatically become a computer statistic.

As part of a program to analyze the causes of accidents and identify "accident-prone" intersections, the Maine State Highway Commission is using an IBM 1130 system to compile an accident data bank.

When an accident occurs, investigating officers make out a special report form that classifies the severity and other characteristics of the accident. In addition, a special code identifying the intersection is entered on the report form.

Coded Intersections

When asked how an officer can determine the exact code of an intersection, Roger L. Mallar, planning and traffic engineer for the state highway commission, revealed that special intersection markers with code designations have been installed at major intersections within the state.

"The system presently covers 22% of our roads; but this covers the areas where over 60% of the accidents occur," said Mallar.

At present the system is operating with 10,000 numbered highway locations, and so far 100 high-accident sites have been identified. These sites are examined by highway engineers who may recommend safety improvements ranging from warning signs to complete reconstruction depending on the results of the computer-aided analysis. Subsequent computer reports enable planners to assess the effect of the changes on accident rates.

The accident data bank classifies accidents according to two major files. The first details the state road system and contains data concerning roadway width, number of access points, type of lighting, and traffic control devices such as warning lights.

The second file classifies accidents according to severity, number of vehicles involved, etc. Each file is split into node and link information.

"This means we can distinguish accidents at intersections from those that occur on straight stretches of road," said Mallar. Periodically, the computer prepares a detailed analysis of accidents for each location.

Safety Improved

"While we don't have enough statistics yet to give the new system definite credit for reducing accidents, we do know that the ability to locate and codify thousands of accidents is a big step toward improving highway safety," Mallar said.

He said that the accident analysis system was begun with 1966 figures forming the initial data base.

At that time the highway commission was using an IBM 1620 that soon proved to be inadequate. After installing a second 1620, the commission switched to the current 1130 system.

"The system has grown so

fast," said Mallar, "that we are now awaiting delivery of a 360/25 to be installed next winter."

As accident reports are received at the highway commission data processing center in the state office building, each report is keypunched for entry into the 1130 system.

Information is accumulated, and the resulting data is stored on disk for later analysis.

Although the exact cause of motor vehicle accidents is difficult to pinpoint, Mallar added that some type of "human error" is almost a foregone conclusion in each case.

At one intersection an inspector recommended warning signs, removal of trees, and a

reduced speed limit. Since the improvements, there have been no accidents at the site.

The computer's analysis also gives planners new insights into accident statistics. For example, while a site may have few total accidents, its accident rate, as calculated by the computer, may indicate a dangerous condition.

"In such a case, we are able to notify the local enforcement agency so they can concentrate their efforts to prevent problems before they occur," Mallar said.

Information compiled by the computer also helps engineers review proposals for new road construction and advise local communities on traffic problems.

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Data entered into the LC-720 is processed by a small digital computer and stored on an IBM/

360-compatible magnetic disc that provides the advantages of bulk storage and high speed random access of data. The problems associated with punched card handling or the mounting, pooling, merging and unmounting of magnetic tape reels are eliminated. All data is conveniently and economically stored in an IBM 1315 disc pack for direct high speed input to your modern data processing system. Naturally, an IBM/360-compatible magnetic tape is also provided with the system as standard equipment.

The LC-720 KeyDisc System also offers for the first time, data verification requiring one input pass only through the system. In addition to the normal technique of verification requiring two different operators, Record size is infinitely variable by each operator from 1 to 120 characters long and the system stores a large library of 30 or more different format control programs, all available simultaneously to any and all operators.

LC-720 KeyDisc System

Bring your own data for a demonstration

Logic Corporation invites you to see an operating demonstration of the LC-720 KeyDisc System at the company's premises. Bring your own original data and Logic will provide a reel of magnetic tape of the output of your data from the LC-720 for later printout at your own computer facility.

To arrange for a demonstration, contact Gary Tischler, Director of Marketing (301) 334-3713

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Claims Second Place

Japanese EDP Growth Seen in Applications, Training

TOKYO — Japan is fast becoming the world's foremost user, as well as producer of computers.

Following the U.S., Japan ranks second in the world for computer usage, having recently edged West Germany into third place, said the Japan External Trade Organization (Jetro).

Land and air transportation booking, in employment information network, automatic medical diagnosis, and foreign language translation are just a few areas in which the electronic computer is being used in Japan today, according to Jetro.

One of the newest electronic computers developed in Japan is an exclusive data-selecting computer called Jetac. The computer has just been installed in the Tokyo head office of Jetro.

The Jetac, manufactured by Nippon Electric Co. under the technological guidance of the electric laboratory of Japan's Ministry of International Trade and Industry, costs far less than a complete general-purpose computer performing all functions.

Jetro says its complete file of 800,000 items of international trade and economic data from all over the world has been classified by country and category and recorded on magnetic tape.

The Jetac is capable of accepting questions containing 15 key words at a time and producing answers within 10 minutes. Its performance is being watched with interest, since its success may lead to the development of similar exclusive-use computers to replace the expensive general-purpose computing system.

Electronic computer utilization by Japanese enterprises and public organizations has grown markedly, with the number of computers installed having reached 4,000 by the end of September, 1968, according to a report recently released by the Japan Management Information Development Association, a private organization engaged mainly in computer research.

The fields in which computers are being utilized include industrial production, marketing, management control, research, man communications, education, medical science, and administration.

One of the most widely known computer applications in Japan is the booking service of the Japanese National Railways (JNR). At present, three Japanese-made computers are in operation in this service, handling about 300,000 tickets per day for the New Tokaido Line and other major JNR lines.

These computers, installed at the central booking center in the JNR's Akihabara station in Tokyo, are linked with about 900 terminals in major railway stations and Japan Travel Bureau offices across the country.

They daily handle reservations for 300,000 express and sleeper tickets for 1,000 trains. A booking for the New Tokaido Line can thus be made in a few minutes from practically anywhere in Japan.

A system unique to Japan is the labor ministry's nationwide employment information network, which makes full use of electronic computers. In this system, 506 public employment



At the booking office for the New Tokaido Line in Tokyo Central Station, ticket requests are flashed to the central booking center where computers automatically check availability of desired bookings and feed back answers in 30 seconds.

offices throughout the country are linked to the ministry's labor market center in Tokyo with exclusive communication lines.

Through this network, data on job openings and job seekers is transmitted from the employment offices to the center in Tokyo, where the information is processed to produce ready-to-use data for job placement officers.

This advanced system has attracted considerable attention abroad, especially in the U.S. — so much so, in fact, that it was taken up as an important subject at a recent session of the Japan-U.S. Committee on Trade and Economic Affairs.

Also noteworthy is an electronic computer for medical use, developed recently through joint efforts of the Tokyo Shibaura Electric Co. (Toshiba) and the Applied Electrical Engineering Institute of Hokkaido University.

Computers here are used widely in medical and biological fields, but their use so far has been limited to research, because of the difficulty of programming and operating the machines.

However, the new computer system, known as an automatic diagnosis machine, does the work of physicians in analyzing electrocardiograms, checking respiratory functions, and performing other clinical chores.

Various medical, diagnostic, and therapeutic data is fed in advance into magnetic tapes, and answers are extracted from the computer in the light of such memorized data.

In this way, complicated diagnoses that normally take days are drawn from the computer in a matter of minutes.

Japan has also produced the world's first "written-English-into-oral-Japanese" electronic computer, according to Jetro.

The computer, equipped with an English vocabulary of some 5,000 words and about 2,000 idiomatic expressions in everyday use, converts a typewritten English message into spoken Japanese.



The central exchange at the labor ministry's labor market center in Tokyo is the hub of up-to-the-minute information on the employment situation throughout the country.



Future computer programmers get "hands-on" experience at Nippon Computer Institute.



At the Matsuyama Department Store in Tokyo, a computer serves as a shopping consultant, suggesting appropriate gift items in accordance with the individual customer's specifications on price, the recipient's tastes, and other particulars.



Computer training starts at vocational high school.



Electronic computer system for diagnostic use is in operation at a hospital installation.

September 24, 1969

Page 23



Clerk at Hirsch & Co. keys in the receipt of stock to the new Vista system offered by Wall Street Information Service, Inc. The system permits all security and cash transactions to be keyed directly into the computer which displays on television screens an up-to-the-second cash and security position.

Vista' Will Give 'Instant' Updated Cage Information

By a CW Staff Writer

NEW YORK—An automation package, designed to help solve the growing brokerage paper work problems, has been announced by Wall Street Information Services, Inc. The firm organized last year by John Diebold Inc. and the Wall Street brokerage firm of Hirsch & Co. The package, called Vista (viewing instantly security transactions automatically), represents a team effort of Leonhardt & Sullivan, industrial engineering and cost consultants; Programming Methods Inc., a communications software firm; and Sanders Associates Inc., whose desktop Model 720 display and input terminal will be used exclusively in the program.

On-Line System

Thomas Alton, president and director of Wall Street Information Services, described Vista as a real time on-line system providing instantly updated information through visual displays in cashier cage operations at brokerages.

Use of the package, he claimed, will cut operating costs by 25%, reduce human errors, provide for greater efficiency in paper work flow, and have substantially on storage space. The first installation of Vista, he revealed, is at Hirsch's office here, where preparations for the new system have been under way since May. Vista is expected to be in full operation at Hirsch by spring, 1970.

Four Sanders terminals at Hirsch's main office on Broad Street and two IBM 360/40 computers at Wall Street Information Services' new offices at E. 19th St. and Park Avenue South, about two miles away, will be linked by leased telephone lines using Data-Phones. Ultimately, a total of 15 to 20 terminals will be installed at Hirsch.

Interface of the terminals with the 360/40s will be facilitated by Intercomm, a software program developed by Programming

Methods Inc. of New York City. The program, first announced in July, required 23 man-years to complete at a cost of more than \$1 million, said George Longnas, PMI president.

Other Advantages

At present, vital information in the brokerage cage can be as much as three days old. In order to satisfy a trade (i.e., an order to sell and an order to buy), brokers have had to borrow stocks they already own. Vista's up-to-the-second securities position information is claimed to have the effect of increasing usable securities and cash by at least 20%. In a small firm, this could translate into \$250,000. Because stocks are controlled electronically, instead of physically, security losses in the cage are decreased.

Last year, security losses amounted to over \$75 million, resulting in the current fingerprinting of Wall Street personnel and a subsequent rise in bonding rates.

New vs. Old Methods

Under traditional methods, a clerk examines securities received by the brokerage to see if they match the routing slip attached, which was prepared by another brokerage house. The clerk locates a matching slip stored in a pigeon-hole labeled with the brokerage-house name. If they match, he receipts the stock and routes it into the cage.

With Vista, the receiving clerk will key into the computer the first two letters of the first two names of the incoming security. On his TV screen he will instantly see a display of all orders expected for that security. He then visually matches the two and keys in an "OK," which updates the master file.

Vista will be offered on a cost-per-trade basis of 50 cents to \$1.00 each, plus a charge for converting the operation and installing equipment.

SDC Viewpoint - Part III

Stock Approach Will Offer SDC New Opportunities for Growth

By Phyllis Huggins
Special CW Correspondent

SANTA MONICA, Calif.—"We are not new to competitive problems. For the past three years we have been scrambling for every dime," said System Development Corp. President Wesley S. Melahn in describing the last few years as a non-profit organization. But SDC's switch to a "for profit"-minded company has given new life blood to the company. Melahn described his feelings on the new status briefly.

"With stock, we will be able to indulge in mergers and acquisitions, but that can't be forecast. We will also be able to open new SDC data centers that could not be done without capital to invest."

SDC has three basic operating divisions: military—public, and commercial.

The commercial division, discussed last week in the second part of this series, presently comprises only 5% of SDC's volume, but will be emphasized in SDC's future growth plans.

One interesting sidelight to the commercial division is the outlook on proprietary software of Robert Hamer, head of the division.

Hamer would make no predictions of future earnings from this source.

"I continue to believe in the field of proprietary software, and I continue to be amazed at the lack of sales in the field," he said.

"The marketplace is there, but the industry is having a hard time making it. I don't understand why they aren't making it."

"There are some competent guys trying."

"As I can't understand it, I can't forecast it," he said.

SDC presently caters to its military division, which brings in about 80% of total revenue. As its prime customer, SDC made certain that the Air Force would be satisfied with their change in status from non-profit to profit-making before they made the change.

They anticipate no alteration in this relationship.

However, SDC does expect to see some reduction in military volume due to cut-backs in government spending.

Thirty to 50 employees are being let go because of the MOL cut-off, for example, but no further reduction of personnel is expected due to military contracts.

In public systems work (about 15%) SDC plans to grow and make profits, although there is still not much money in this field for big projects.

As Melahn put it, "We don't expect any big profits in this area, but we will stay in it."

"We have had 500 to 600 contracts in this area of effort. Some day the problems of health, education, pollution, etc., are going to have to be solved."

So goes the battle with SDC, a \$60-million-a-year software company as it leaves the regulated field of a "nonprofit company" to join the rough and tumble world as one of the largest software firms.

Randolph, Travelers Agreement Approved

November.

HARTFORD, Conn.—The board of directors of The Travelers Corp. and Randolph Computer Corp. have approved in principle a merger agreement between the two companies.

The proposed acquisition by Travelers of Randolph was announced August 1.

The merger agreement is subject to the approval of Randolph stockholders and the consent of certain institutional lenders of Randolph.

Travelers President Roger C. Wilkins said that Randolph will continue as a separate, autonomous subsidiary of Travelers with headquarters in Greenwich, Conn.

The agreement calls for exchange of 1.25 shares of Travelers common stock for each share of Randolph common. Based on the present number of shares of Randolph outstanding, the transaction will require about 3,100,000 shares of Travelers common stock with a total value of about \$90 million to \$100 million.

In addition, about 350,000 Travelers shares will be reserved for possible future issuance upon conversion of Randolph's outstanding convertible debentures and exercise of its outstanding employee stock options.

The proposed acquisition, according to Wilkins, will make a significant contribution to Travelers earnings.

The Travelers Companies conduct an all-lines insurance business and have substantial interests in broadcasting, real estate, and equity products.

Randolph is involved in computer leasing, data center opera-

tions, software development, and data processing education.

In the twelve months ended June 30, Randolph had reported of \$38.7 million with pretax income of \$8.6 million. At that date, Randolph owned \$165.8 million of computer equipment.

WU Designs Restructuring For Aggressive DP Growth

NEW YORK—Western Union expects to spend up to a half-billion dollars by the mid-Seventies "building a new-type national computer-based communications company."

Earlier in the year, the company revealed plans for a major corporate restructuring that would permit greater financial flexibility to maximize growth opportunities.

In a speech before institutional investors attending a telecommunications seminar at New York's Hotel Pierre, Western Union's Chairman and President Russell W. McCall said:

"The pace of technological excellence in the communications industry has not been cheap and could be more expensive in the future."

McCall told the group that Western Union has spent more than a half-billion dollars since 1965 "modernizing, expanding, and keeping pace with continuing customer demands for greater computer-based technological innovation."

"Present plans call for even

larger, more sophisticated computers, still gives integration of data processing and communications."

In the twelve months ended June 30, Randolph had reported of \$38.7 million with pretax income of \$8.6 million. At that date, Randolph owned \$165.8 million of computer equipment.

"This will require enormous additional capital investment," he said, "not less than \$100 million a year for the next few years—perhaps as much as a half-billion dollars by the mid-Seventies."

Commenting on the impact technology has had on Western Union in recent years, McCall said:

"As a scant two decades communications has moved from an industry that has relied for more than a century almost solely on the telephone and telegraph into one that is based on the relatively revolutionary concept of total integrated communications."

"As a result," McCall said, "the computer has become a basic and growing part of our expanding facilities plant and an integral part of our business. In the newer services we offer now and

(continued to Page 29)

Dull Market Continues

Individual Issues Provide Interest

By A.B. Williams

CW Staff Writer

During the four week end Sept. 12, the market has managed to fight off any notions that it might be about to make a broad rally. It has weathered the kind of rumors—Vietnam peace and lower interest rates—that would have brought a good rise in CW's Composite index only a few months ago.

Of more interest than the overall trend has been the actions of a few computer issues. Digital Equipment, which has had a way of turning in ever-better earnings reports for quite a long time, went up over 20% in the month. The company is the major manufacturer of mini-computers and

is in a position to cash in on the market it created almost single-handedly.

A number of stocks seem to be showing the effects of a "Let's look for established, rising earnings records" sentiment. Optical Scanning, which peaked earlier this year at 118, lost 13 points during the month, including 9 in the last week. The company's stock closed at 48 on Sept. 12. Its year-to-year earnings comparisons have been suffering since the first of the year (the company's fiscal half).

Some others that have hit new lows recently include Alphametrics, Cognitronics, Digitronics, Farrington, and REL. The peripherals group includes a

number of companies whose performances (earnings-wise) haven't matched the hopes inherent either in overall industry projections or in specific product lines. Technology moves, but perhaps the risk of "competition, with or without" something better," has chipped up some submarkets or put some prospects on the fence.

New Listings

Two companies have shown remarkable, and remarkably different price patterns following recent listings on a major national stock exchange.

During the week ended July 18, Electronic Memories & Technologies moved from over-the-counter trading to the New York Stock Exchange. During the eight weeks following the move, EMM stock has gone up more than 30%, from just under 50, to 66.

Applied Data Research, which began trading on the Amex during the same week, has lost more than 25%, going from 12 1/2 to 23 1/4. The major loss (five points) occurred in the week ended Aug. 22. One reason given for the decline is that the recent full acquisition of Programmatic can't help ADR's near-term earnings outlook. The parent helped Programmatic out in the past. Also, in a rather thin issue, such as ADR, a little selling goes a long way, particularly in a down market.

Honeywell Raised Computer RD&E By Over 30%

WELLESLEY HILLS, Mass. — Honeywell has increased expenditures for research, development, and engineering work in the fields of computers and communications products and services for 1969 by more than 30% of comparable 1968 figures.

Total corporate expenditures for RD&E will increase 10.7% to \$141.5 million for 1969, up from the \$127.8 million spent in 1968, when the worldwide automation firm's sales reached a record \$1.3 billion, said C.W. Spangle, vice-president and general manager of the electronic data processing division, based here.

The company-funded portion of the total RD&E expenditures will increase to \$80 million, up 31% over the \$61.3 million spent in 1968, he said.

Of this company-funded total, Spangle said more than \$40 million will be invested in computers and communications products and services developments, an increase in excess of 30% over the more than \$30.65 million spent during 1968.

Research and development performed under contract to the federal government is expected to decline to \$61.2 million in 1969 from \$66.5 million in 1968, an 8% drop, Spangle added.

The company released the figures in conjunction with National Research Week.

COMPUTER STOCKS: TRADING SUMMARY

LISTED CLOSE 9/11/69 CLOSE 9/17/69

COMPUTER SYSTEMS				WEEK	WEEK
SYMBOL	CLOSING	PRICE	RET.	CHANGE	CHANGE
N 153-180	140 3/4	BURROUGHS CORP.	+ 2	3/4	1-87
N 153-180	140 3/4	CONTROL DATA CORP.	+ 2	3/4	1-87
N 153-180	140 3/4	DIGITAL EQUIPMENT	+ 2	3/4	1-87
N 153-180	140 3/4	GENCOR ELECTRIC	+ 2	3/4	1-87
N 153-180	140 3/4	HEWLETT-PACKARD CO.	+ 2	3/4	1-87
N 153-180	140 3/4	IBM CORP.	+ 2	3/4	1-87
N 153-180	140 3/4	INSTRON INC.	+ 2	3/4	1-87
N 153-180	140 3/4	JOHN DEERE CORP.	+ 2	3/4	1-87
N 153-180	140 3/4	RAYTHEON CO.	+ 2	3/4	1-87
N 153-180	140 3/4	SPERRY RAND CORP.	+ 2	3/4	1-87
N 153-180	140 3/4	SPERRY RAND CORP.	+ 2	3/4	1-87
N 153-180	140 3/4	SPERRY RAND CORP.	+ 2	3/4	1-87

PERIPHERALS & SUBSYSTEMS				WEEK	WEEK
SYMBOL	CLOSING	PRICE	RET.	CHANGE	CHANGE
N 82-15	75	ADDRESSOGRAPH-NELT	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
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N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87

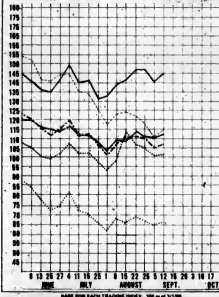
SUPPLIES & ACCESSORIES				WEEK	WEEK
SYMBOL	CLOSING	PRICE	RET.	CHANGE	CHANGE
N 82-15	75	ADDRESSOGRAPH-NELT	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87

SOFTWARE & TOP SERVICES				WEEK	WEEK
SYMBOL	CLOSING	PRICE	RET.	CHANGE	CHANGE
N 82-15	75	ADDRESSOGRAPH-NELT	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87

LEASING COMPANIES				WEEK	WEEK
SYMBOL	CLOSING	PRICE	RET.	CHANGE	CHANGE
N 82-15	75	ADDRESSOGRAPH-NELT	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87
N 82-15	75	ALPHAMETRICS	+ 1	3/4	1-87

Computer Stocks Trading Index

Computer Systems Software & Top Services
Peripherals & Subsystems Leasing Companies
Supplies & Accessories CW Composite Index



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Newtonville, Mass. 02160

Reports

MOORE CORP. LTD.

3 Months Ended June 30
1969 1968

Shr Emd 8.28 8.28
Revenue 96,516,000 82,980,000
Earnings 8,015,000 7,146,000

a Mo
Shr Emd .56 .50
Revenue 85,888,000 184,970,000
Earnings 15,964,000 14,303,000

OPTICAL SCANNING CORP.

Year Ended June 30
1969 1968

Shr Emd 87,085,000 48,71
Revenue 5,633,000
Earnings (202,454) 503,562

(Loss)
Tax Cred 214,000
a-Based on income before tax credits.
b-Equal to 81.12 a share.

POTTER INSTRUMENT CO.

Year Ended June 28
1968 1969

Shr Emd 8.77 8.48
Revenue 51,006,085 20,401,246
Earnings (202,454) 503,562

(Loss)
Tax Cred 214,000
a-Based on income before tax credits.
b-Equal to 81.12 a share.

PLANNING RESEARCH CORP.

Year Ended June 30
1969 1968

Shr Emd 8.64 8.54
Revenue 66,968,000 49,982,246
Earnings 2,884,000 2,227,084

a-Preiminary. b-Restated for
adjustments on a pooling-of-interests
basis. c-Adjusted for a 100% stock
dividend in January, 1969.

PROGRAMMED & REMOTE SYSTEMS

Year Ended Apr. 30
1967 1968

Shr Emd 8.08 8.14
Revenue 1,195,239 938,800
Earnings 51,291 53,961

SCIENTIFIC RESOURCES

9 Months Ended June 30
1969 1968

Revenue 855,600,265 812,626,273
Net Cont 494,551 (1,01,560)
Loss Dtd 1,063,471
Op 8,873,528
Spec Cred
Earnings (Loss) 494,551 (291,708)

a-Restated by company to reflect the
disposition of Colonial Mortgage
Service Co., and the acquisition of

Mauchly Associates and Nuclear
Associates, on a pooling-of-interests
basis. b-From the sale of Colonial
Mortgage Service.

TECHNICAL TAPE, INC.

6 Months Ended June 28
1969 1968

Shr Emd 8.09
Revenue 14,551,964 812,129,671
Spec Cn 82,200,000
Earnings 256,541 (4,255,959)

a-Provision for loss on abandonment
of certain product lines.

TECHNITROL INC.

3 Months Ended June 30
1969 1968

Shr Emd 8.14 8.04
Revenue 3,454,646 2,095,687
Earnings 191,641 61,410

a Mo
Shr Emd 20
Revenue 6,411,624 4,556,742
Earnings 280,305 2,500

TWIN DISC INC.

Year Ended June 30
1969 1968

Shr Emd 82.14 881.57
Revenue 54,126,967 46,184,819
Earnings 3,124,118 2,289,951

a-Adjusted for a 20% stock dividend
in April 1969.

UNIVERSITY COMPUTING CO.

6 Months Ended June 30
1969 1968

Shr Emd 81.11 8.44
Revenue 49,000,000 26,900,000
Earnings 6,600,000 2,700,000

a-Includes acquisitions on a pooling-
of-interests basis.

SYSTEMS ENGINEERING LABS

Year Ended June 27
1969 1968

Shr Emd 8.70 8.50
Revenue 17,294,000 12,052,000
Earnings 1,453,000 985,000



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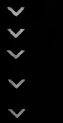
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Eastman Dillion to Install 2 CDC 3300s For Complete Security Order Matching

NEW YORK — Eastman Dillon, Union Securities and Co. will install two Control Data 3300 computers as the heart of a brokerage control system designed to handle stock market transactions for customers in the firm's 33 branch offices.

The CDC 3300s will replace two Control Data 8090 systems, in operation since January, to provide Eastman Dillon with complete order-matching capability.

The 3300 computers will expedite automatic matching and processing of all securities listed

on the NYSE and Amex.

The system searches files of buy, sell, and open orders and matches each execution report with the customer's order.

Eastman Dillon's expanded automated system accomplishes this process at computer speeds.

As an order is received for a stock on the NYSE or Amex, the CDC 3300 brokerage control system verifies the order number, order type, the number of shares, the stock exchange symbol, price instructions, and account identification.

As the order is transmitted to

the exchange floor in perfect format, it is simultaneously stored in an electronic computer file.

When the execution report is received from the stock exchange, the computer searches the file of customer orders for the matching one and automatically matches the order and execution report.

Reports of executions are made available to customers within seconds, according to CDC.

At the end of each trading day, the computer file will be used to provide branch offices with printed confirmations as well as open order file maintenance.

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Orders and Installations

Sanders Associates, Inc. of Nashua, N.H., has received an order from Montgomery Ward, Inc. of Barrington, Ill., for several electronic data entry systems that will be used in a pilot project at the company's home-office to replace punch machines in its mail order business. The system 6000, used to enter data directly onto magnetic tapes, tapes to a keyboard, permits visual verification of all information prior to entry into the computer.

The American Oil Co. has contracted Applied Dynamics, Inc. for a complete analog/hybrid computing system that includes a 100-volt analog/hybrid computer, an interface system, and specialized software program developed by Applied Dynamics for hybrid system communications and management routines. The system will be used for a wide range of investigations, including simulation of refinery processes.

Two Control Data Corp. computer systems will be tied together to provide the electric utility companies in the Netherlands with a highly diversified data processing system. SEI and KEMA, located in Arnhem, are central organizations for all the electrical utilities in Holland. The two organizations installed CDC 3150 and CDC 1700 systems to constantly monitor SEP's electrical power network, while performing scientific and some business data processing tasks for KEMA and the utility companies.

Numerical information from more than 50 million Giro payment orders will be read each year by a bank of three ICL document readers (Type 8201) linked to a 1901 computer at the Department of Health and Social Security, Newcastle upon Tyne, England. The document readers are the first from ICL to have OCR attachments, according to ICL.

The Rietor Co., a Swiss manufacturer and exporter of spinning machinery, has purchased a \$2.7-million Univac 1198 system for use at its headquarters in Winterthur, near Zurich, for production planning and control, technical and scientific problem solving, and for planning and forecasting.

A \$199,200 computer system built by Information International has been ordered by Sandia Laboratories, Albuquerque, N.M. The computer system, an optical information sensor and processor capable of measuring and interpreting real-world scenes, will be used by the reduction division of Sandia to digitize graphical and pictorial data on a production basis, replacing the slow manual methods presently being used.

Doyle Dane Bernbach, Inc., a New York advertising agency, will use its new Honeywell 120 computer for media client billing, media payments, production payments, job cost accounting, partial media estimating, insertion writing, and specialized media accounting to conform to procedures of certain clients.

General Medical Corp. of Richmond, Va., has ordered a Burroughs B500 to be linked with the Burroughs 2400 desk-top billing computers located in the firm's 16 branch offices to facilitate accounting procedures.

Nacogdoches Computer Service, Inc. in Nacogdoches, Texas, has installed a Burroughs B500 for use in handling the operations of the two banks that founded the center.

The Cabotus Flour Co. has installed an IBM 1130 computing system to track demand for each of the more than 2,000 items in its inventory and maintain current accounts.

Information Systems Management, a computer software firm headquartered in Richmond, Wash., has ordered an IBM 1130 computer system for its computer operations center.

Security National Bank of Battle Creek, Mich., will install a Burroughs B500 to be linked to a Burroughs B300 at the firm's data processing center, enabling the bank to meet expanding needs in its charge card operations.

Dresser SIE delivered an LGP 2703 Lasergraphic off-line plotting system to Houston-based Seismic Computing Corp. for use in plotting seismic presentations of geophysical and geological data. The LGP 2703 device has been installed and is being checked out in Houston, which it will be shipped to London to be integrated into Seismic's United Kingdom subsidiary, Seismic Limited, and used for clients operating in Europe, Africa, and the Middle East.

An EMR Computer Co. Advance 6070 system has been ordered by Gulf Oil Canada Limited, Calgary, Alberta, for seismic application. Gulf Canada's new 6070 will include 24,376 words of core memory, a seismic communication system, teletypewriter, card reader, line printer, magnetic tape, and disk files.

Ibcn Data Systems of Los Angeles, an independent computer service facility and software house, has ordered a \$4.5-million Control Data Corp. CDC 6500 system for delivery in early 1970.

The communications biophysical group at the Massachusetts Institute of Technology has ordered a Digital Equipment Co. PDP-12 for laboratory applications.

The Deutsche Forschungsgemeinschaft, a central organization for the promotion of science and research in the German Federal Republic has contracted for a \$1.7-million Univac 1108 system for the Computer Center of Frankfurt for applications in the field of mathematical engineering and economics, as well as for training students in data processing.

Delivery and installation of an RCA Spectra 70/45 and related equipment took place at the headquarters of Omega Computer Corp., a Los Angeles computer utility service.

New Registrations

AMPEX CORP., 401 Broadway, Redwood City, Calif., a company that manufactures, markets, and services operations in various fields including the computer industry, filed to register 500,000 shares of convertible subordinated debentures, due 1984. Proceeds intended to retire bank credit agreements and short-term notes. The underwriter is Blyth & Co., Inc., Russ Blyth, San Francisco, Calif., and Edward Fries & Co., 44 Wall St., New York, N.Y.

DIOMED CORP., 4600 W. 77th St., Minneapolis, Minn. 55425, a company that develops input/output devices specifically designed for application in the field of image processing and applied to diagnostic radiology, filed to register 350,000 shares of common stock. Proceeds, at \$5 per share maximum, intended for manufacturing and test equipment, for parts and materials, and for test software and initial systems software. The underwriter is John C. Kinnard and Co., Inc., 110 S. 7th St., Minneapolis, Minn.

KENNEY COMPUTER INSTITUTE, INC., 116 W. 14th St., New York, N.Y. 10017, a company that provides training in the use of electronic EDP equipment, filed to register 90,000 shares of common stock. Proceeds, at \$5 per share, intended for general corporate purposes. The underwriter is Investors Circle, Inc., 315 West Whitman Road, Huntington Station, N.Y.

ARON HUGHES COMPUTER CORP., 250 Broadway, New York, N.Y. 10007, a company that leases and purchases computer time between computer users, filed to register 100,000 shares of common stock. Proceeds, at \$5 per share, intended for purchase of computer equipment for a lease-back program, for recruitment and training of salesmen, and for general corporate purposes, including acquisitions. The underwriter is H.E. Simpson Securities, Inc., 40 Exchange Place, New York, N.Y.

TECHNITREND, INC., 7300 N. Crescent Blvd., Pennington, N.J. 08110, a company that designs, manufactures, fabricates, and markets computer input/output terminals, computer interface equipment, and data communication equipment for suppliers and/or users of real-time processing services, filed to register 115,000 shares of common stock. Proceeds, at \$12.50 per share, are intended for research and development. The underwriter is Bevier, Davis & Noble, Inc., 116 John St., New York, N.Y.

ROBINSON-HALPERN CO., 5 Union Hill Road, West Conshohocken, Pa. 19383, a company that designs, develops, manufactures, and sells transducers for computers and other applications, filed to register 110,000 shares of common stock. Proceeds, at \$5 per share, intended to pay obligations assumed in connection with the acquisition of High Temperature Instruments Engineering Corp. and to acquire patents from Paul Beckman (PHI's sole shareholders). The underwriter is Robinson & Co., Inc., 1500 Chestnut St., Philadelphia, Pa.

LEVINTOWNSBEND COMPUTER CORP., 445 Park Ave., New York, N.Y. 10017, a company that develops EDP equipment, filed to register 85,000 shares of debentures, due 1974, and common stock. Proceeds, at \$1,000 per unit (each unit consisting of a \$1,000 debenture and common stock, the number of shares to be supplied by debenture holders), intended to retire short-term indebtedness and to provide working capital. The underwriter is J.N. Russell & Co., Investment Bankers, Cleveland, Ohio.

RAYCOM INDUSTRIES, INC., 1000 Ave. A, New York, N.Y. 10018, a company that is engaged in the development of software for computer users, filed to register 300,000 shares of common stock. Proceeds, at \$7.50 per share, intended for purchase of electronic standards and instrumentation, for purchase of computer and peripheral equipment for acquisitions, for marketing and preparing proposals for government contracts, and for general corporate purposes. No underwriter is involved.

SYSTEMS ENVIRONMENT CENTERS, INC., 200 Terminal Ave., New York, N.Y. 10011, a company that intends to develop and operate centers for processing educational centers and the development of software, filed to register 145,000 shares of common stock and 145,000 common stock purchase warrants. Proceeds, at \$8.25 per unit (each consisting of one warrant and

one share), intended for preparation of course, for advertising and marketing, for equipment for three centers, and for operating expenses. No underwriter is involved.

NATIONAL COMPUTER FRANCHISE CORP., 4433 Touhy Ave., Lincolnwood, Ill. 60460, a company that will establish, on a franchise basis, a national computer network consisting of time-sharing centers utilizing equipment and programs to be furnished by Honeywell, filed to register 150,000 shares of common stock and 150,000 common stock purchase warrants.

Proceeds, at \$12 per unit (each unit consisting of three shares and two warrants), intended to retire short-term indebtedness, to acquire programs, and to promote franchise sales. The underwriter is Chartered New England Corp., 90 Broad St., New York, N.Y. 10004.

COMPUTER CONGENERICS CORP., 2000 Classen Blvd., Oklahoma City, Okla. 73106, a company that proposes to engage in various phases of the computer business, filed to register 400,000 shares of common stock.

Proceeds, at \$3 per share, intended for application to its interests and related purposes. The underwriter is Shoemaker & Co., Inc., Oklahoma City, Okla.

COMPUTER OUTPUT SYSTEMS CORP., 10950 N. Tantau Ave., Cupertino, Calif. 95014, a company that is engaged in the research, development, manufacture, and marketing of computer output microfilm systems for the recording, storage, and retrieval of computer-generated data on various reduced-size media, filed to register 450,000 shares of common stock. Proceeds, at \$5 per share, intended for the purchase of equipment and operating expenses. No underwriter is involved.

INTEL CORP., 385 Middlefield Road, Mountain View, Calif. 94040, a company that develops advanced semiconductor products for application in digital data processing systems, filed to register 360,000 shares of common stock, at \$17.50 per share maximum, intended for land acquisition, purchase of equipment, product development, and production engineering. The underwriter is Hayden, Stone Inc., 25 Broadway, New York, N.Y.

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Computing and Software, Inc., of Los Angeles has signed a definitive agreement to acquire Preferred Business Service Corp., a Chicago organization providing data processing specialists and business personnel on limited-duration assignments with corporations throughout the U.S. An undisclosed number of shares of Computing and Software common stock will be issued for PBS and PBS Data Service Corp., a wholly owned subsidiary. The proposed merger is subject to approval by appropriate regulatory agencies.

An agreement in principle was reached whereby Hudson Leasing Corp. was acquired by Industrial Bancorp, Inc. The acquisition would be effected through a

tax-free exchange of one share of a new class of Industrial Bancorp cumulative convertible preferred stock for each share of Hudson common stock at ratios increasing from 1 to 1.5 shares, depending upon the net income of Hudson during the next five years. The acquisition is subject to approval by stockholders and directors of both companies.

Fabri-Tek, Inc. of Minneapolis, Minn., has moved to acquire the connector division of National Connector Corp. in an agreement in principle involving \$1,975,000 in cash, notes, and stock. Final purchase price is dependent upon the continued profitable operation of the connector division through March, 1971.

Both boards of directors have approved the acquisition of K.I.E.S. Computer Center, Inc., Geneva, N.Y., by The Computer Exchange, Inc. for 15,000 shares of CEX common stock and an additional number of shares to be added in the future, depending upon future earnings of K.I.E.S.

An agreement in principle has been signed whereby Computer Communications, Inc. will acquire Wesal Industries, Inc., subject only to the completion of a certified audit and to final approval by the CCI board of directors. Wesal, a diversified company that manufactures computer components, data terminal systems, and aircraft parts and missile components,

will operate as a wholly owned subsidiary of CCI.

An agreement has been made to acquire the business and assets of Skouken Tax Service, Inc. by Tax Corporation of America. Under the agreement, which is subject to the approval of STS stockholders, TCA will issue common stock valued at up to \$4.8 million for Skouken, based on the earnings growth over the next three years.

Science Management Corp., a management consulting firm, has agreed in principle to acquire Motion Associates East, Inc. and affiliated companies, whose primary business is film production, and Decision Studies Group, a company engaged in applied research. All outstanding stock of Motion Associates, which is privately held, would be exchanged for stock of SMC, publicly held. The purchase of Decision Studies Group, also privately held, would be for cash.

Industrial Computer Laboratories, Inc., a computer systems engineering, development, and manufacturing company, has acquired the assets of Digi, Inc. of Salt Lake City, Utah. ICL is a subsidiary of Information Technology & Systems, Inc., a financial and management corporation.

Gan Computer Corp. of Phoenix, a company engaged in application software development with emphasis on computer graphics, has been purchased by Readlab, Inc. of Dallas for an undisclosed amount of cash and stock.

Calculator-Computer Leasing Corp. has reached an agreement in principle to acquire the Business Technical Institute, Pittsburgh, Pa., a computer programming school, in exchange for notes and cash.

Sigma Systems Corp., a Dallas-based electronics research and manufacturing company, will acquire two Colorado firms, the C.M. Hathaway Engineering Laboratory of Colorado City and Vaseco Products Co., a Boulder plastic-injection molding company. Terms of the transaction, which has been agreed to in principle, provide for each of the Colorado companies to become a wholly owned subsidiary of Sigma in an exchange of stock with Sigma.

An agreement has been made to acquire Tab-Fax Service Bureau, Inc., a Milwaukee statistical and accounting service center, for an undisclosed amount of shares by Facs Data Center, Inc., Chicago. The accounting portion of the Tab-Fax business will be sold, as it is contrary to Facs policy to do actual accounting, while Tab-Fax will be transformed into a high-speed input center for preparation of data for rapid computer processing.

Strategic Industries, Inc., an affiliate of Strategic Systems, Inc., has exercised its option to acquire L. Thayer & Co., Inc., an importer and distributor of general merchandise, for an undisclosed amount of cash and common stock.

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University Computing to Increase Share Equity of Two Computer Subsidiaries

DALLAS—An agreement in principle has been reached by the managements of University Computing Co. and its majority-owned subsidiaries, Computer Leasing Co. and Computer Industries, Inc., whereby University would increase its ownership to 100% of the two subsidiaries.

The increase would be accomplished by merging CLC and CII with new wholly owned subsidiaries of University, resulting in the exchange of University Computing common stock for the publicly held minority stock interests in CLC and CII.

University Computing presently owns about 53% of Computer Leasing and about 85% of Computer Industries.

The agreement provides an exchange of one share of University Computing common stock for each 3.4 shares of Computer Leasing, and one share of University Computing common stock for each 4.4 shares of Computer Industries.

Based on shares of capital stock of CLC and CII presently outstanding, the exchange would require approximately 633,000 shares of University common stock, and an additional 144,000 University shares would be reserved for options, warrants, and convertible securities.

The transactions are subject to the approvals of the boards of directors of the three companies, the stockholders of CLC and CII, and the consent of lending institutions and regulatory authorities. Dates for stockholders' meetings will be determined later.

Both Computer Leasing and

Computer Industries have been subsidiaries of University Computing since their formation, and minority public ownership for both was originally established by distributing shares of their common stock to stockholders of University Computing Co.

Computer Leasing Co. represents the equipment leasing function of UCC and has about \$150 million in computer systems leased to customers.

Computer Industries, Inc. represents the manufacturing function of UCC and makes a range of computer terminals and peripheral equipment, much of which is used in UCC's multinational computer utility operations. CII equipment sales in 1968 amounted to \$11 million.

"UCC is now large enough to grow all parts of its business with internal resources, which was not as true in 1967 when independent financing and outside investment was needed to establish subsidiary operations," President Charles J. Wyly said.

"UCC does not view the future leasing of computers as a separate business of financing off-the-shelf models, which are not always appropriate for a customer's needs. Instead, the financing facility is part of providing a tailored computing service, in which several functions of UCC add value to the customer's contract and where the appropriate equipment mix has a high degree of UCC proprietary," Wyly explained.

UCC has a similar intent for its manufacturing function. "To maximize profit opportunities, the determination of products for UCC to use or sell—from

the least sophisticated computer terminal to the fourth-generation UCC system—should be in the context of UCC's whole business."

The UCC announcement notes that the effect of the merger transactions on 1969 operating results would be slight, but would favorably influence long-range goals. UCC has consolidated subsidiary revenues in the past, except for intercompany transactions and minority interests. Total ownership of the subsidiaries would add an undetermined amount to net income, but because of the additional UCC shares expended in the exchange, there would not be any material effect on 1969 earnings per share, says the company.

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WU Designs Restructuring For Aggressive DP Growth

(continued from Page 23)
plan to offer in the near future."

He said Western Union's proposed restructuring—the first in 118 years—should enable the company to take maximum advantage of this high-growth market.

Restructuring should also improve the company's ability "to more aggressively expand into nonregulated communications activities that are not subject to the stringent financing and operational restraints associated with the telegraph operations," McFall said.

The restructuring plan calls for the formation of an entirely new

company—Western Union Corp., with The Western Union Telegraph Co. as a wholly owned subsidiary.

The plan is subject to approval by shareholders at a special meeting in November and by regulatory agencies.

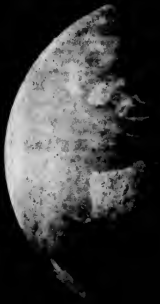
Western Union currently provides business and industry, government, and the general public with a broad range of record communications services, including leased private services, shared-use computer systems, and Telex. The company's total revenues in 1968 were \$368 million. Net income was \$22 million.

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Contracts

The Moroccan government has selected International Development Services, Inc., a subsidiary of EDP Technology, Inc., for negotiation of a substantial economic planning contract. The project, to be financed by an Agency for International Development grant, will be for planning and implementation of a five-year agricultural program for Morocco.

Under the contract, technical assistance will be provided the Moroccan Ministry of Agriculture to include aid in agricultural planning, program analysis and budgeting, the identification of priorities, and implementation of a five-year plan for that country.

Computer Sciences Corp. is delivering to Nasa operations centers an extremely comprehensive computer-based system for structural analysis for such complex structures as spacecraft, landing vehicles, large transport aircraft, and tracking antennas. The latest Nasa center to receive the new system, called Natran, is Ames Research Center, near Mountain View, Calif.

Planning Research Corp. has been awarded a \$1,407,855, indefinite-quantity contract from the Department of Defense, Navy Purchasing Office, to provide programming services in support of Navy type commanders (Tycoms). The work will be performed at various naval activities through PRC Data Services, Inc., a newly formed subsidiary of Planning Research.

Informatics, Inc. has received a subcontract from Ernst & Ernst, to help plan, develop, and implement a statewide financial management and reporting system for the state of Nevada under an appropriation of \$596,000.

National Cash Register Co.'s military division is producing an electronic teleprinter as part of a new satellite navigation system under a Department of Defense contract for International Telephone and Telegraph Corp.'s military version of the "reconlink" system.

An electronic display system that will be used as a research tool in the investigation of advanced visual display systems for aircraft; supersonic aircraft; and vertical, short take-off and landing aircraft has been delivered to Nasa's Electronics Research Center in Cambridge, Mass., by Sanders Associates, Inc. The Sanders Adds/900 System, together with a Nasa computer, will be used to design flight displays for test in actual flight aboard V/STOL aircraft.

Delta Caribe, a San Juan-based bureau jointly owned by Delta Data Systems and a group of Puerto Rican management consultants, has signed a long-term data processing contract with Blue Cross of Puerto Rico.

Planning Research Corp. has been awarded a \$411,000 contract from the Nasa Goddard Space Flight Center to continue reliability studies for the next two vehicles in the Applications Technology Satellite program.

These studies will be similar to ones performed by Planning Research for the first five ATS vehicles.

Qatron Corp. of Rockville, Md., has received a \$275,000 contract from Nasa's Goddard Space Flight Center to build several recorder/receiver switching and preprogrammable patch systems for use in future Apollo flights in the ground-support area.

The U.S. Department of Housing and Urban Development has awarded a \$200,000 contract to EDP Technology, Inc. and a \$45,000 extension to an existing contract, under which EDP will gather and convert data for the

modal cities administration data management system and facilitate continued performance of the data collecting operations prior to implementing the initial operating system.

The City of Boston, Mass., has awarded an initial \$15,000 contract to Computer Systems Engineering, Inc. of Burlington, Mass., to demonstrate the feasibility of using a computer and an all-electronic system to control traffic in downtown Boston. The simulated field demonstration will show how vehicular and pedestrian traffic flows can be improved at two busy intersections dotting the city's Government Center area.

The Communications Satellite Corp. will award a contract to the government electronics division, Motorola, Inc., Scottsdale, Ariz., for a study of high-speed digital logic circuits. The Motorola study will seek to determine the best way or ways to achieve speeds of 200 to 500 megabits per second in anticipation of the increased satellite communications and signal processing requirements of the mid to late '70s.

Conrac Corp. has received an order from General Electric Co. for 300 additional CRT displays to be used in the GE Datamat 760 keyboard/display system.

Credit Systems, Inc. has ac-

quired a five-year contract from Leonardo department store to Credit-Check on-line credit authorization system to provide instantaneous authorization of all credit purchases.

Amperx Corp. will supply electronic core memories and magnetic tape drives totaling approximately \$700,000 in value to Dialog Computing, Inc. for on-line operation with IBM 360 systems.

Conrac Corp. has received a \$400,000 production contract from IBM for solid-state CRT display devices that will be installed in IBM-manufactured data terminals for American Airlines' Sabre reservations system.

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general purpose tabulation and summary reporting system, is also doing very nicely, thank you, at several leading companies.

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